

JPO109564

33-

図

図1

FIG 1

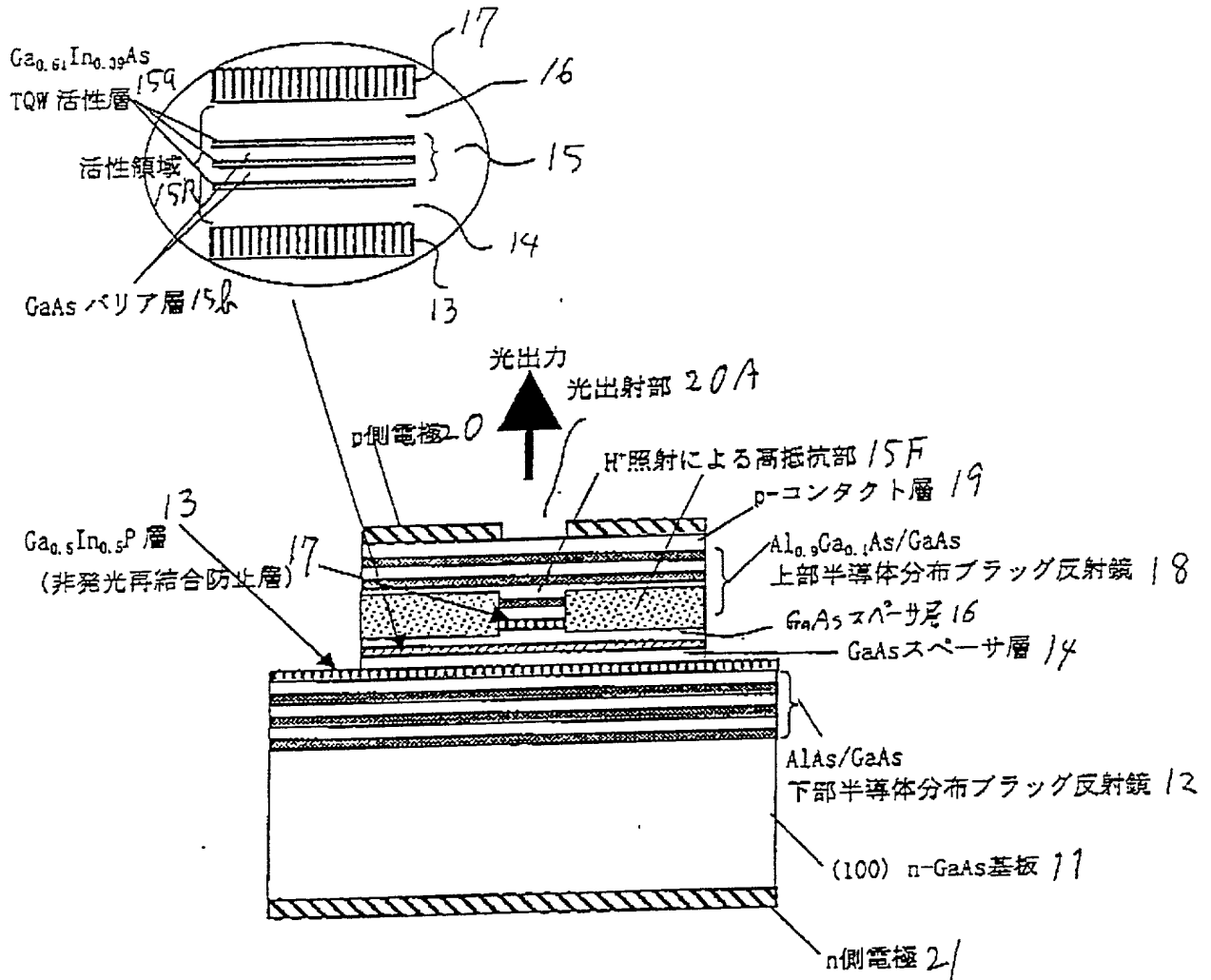
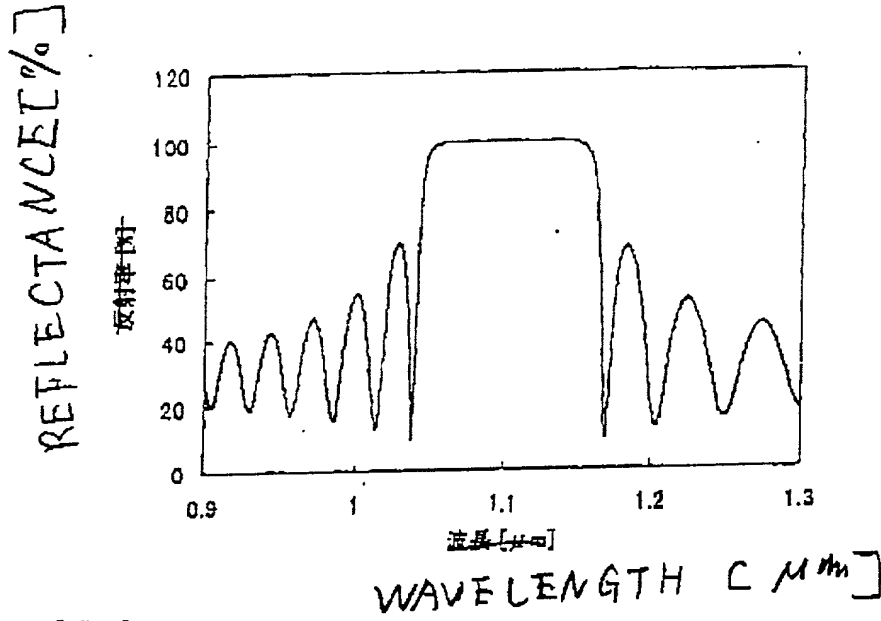


図1

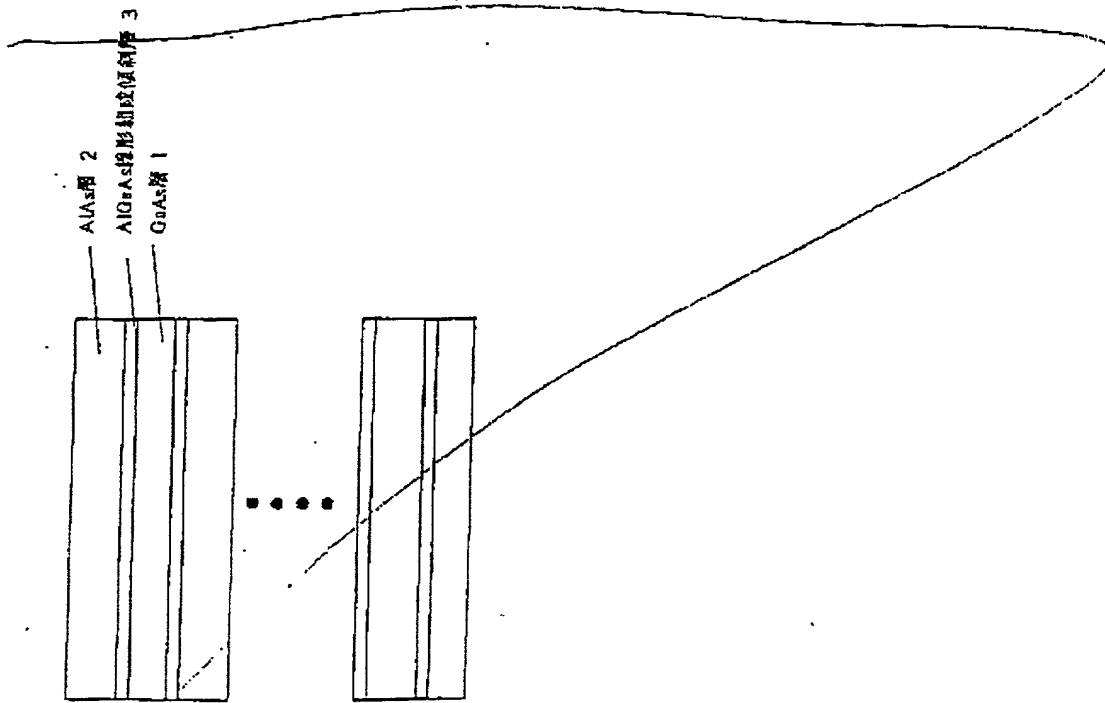
10085204.022600

[2]

FIG 2



[图 2]



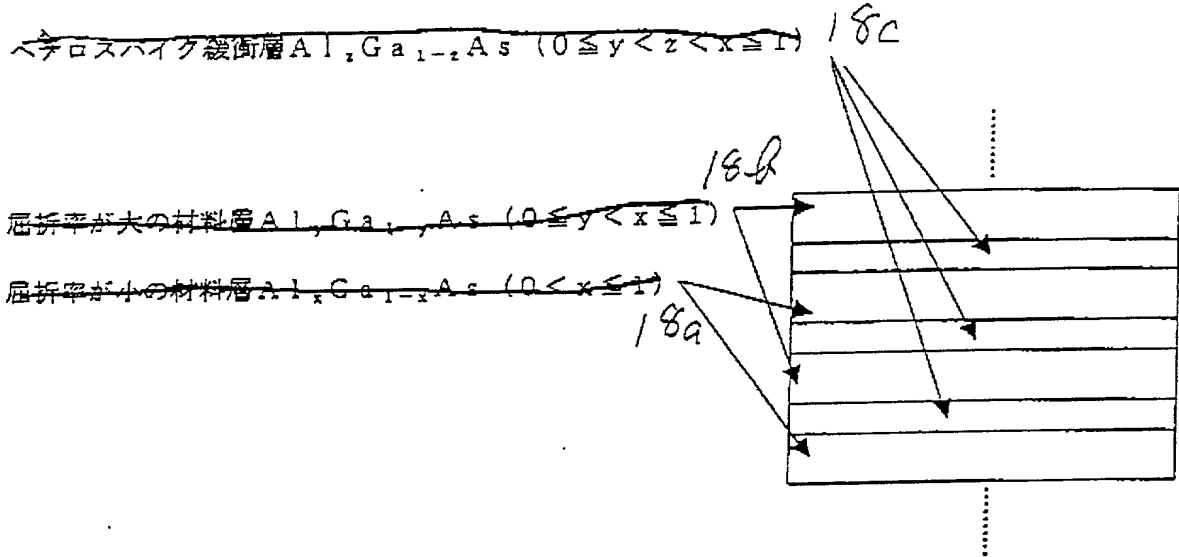
[图 3]

200220" 4025500T

[A]
3

FIG 3

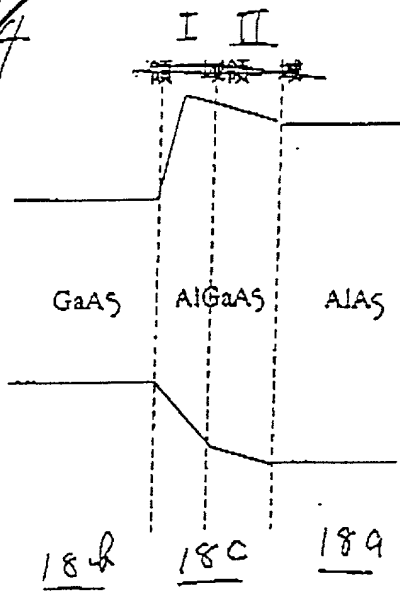
18 (12)



209220 40258001

~~[図3]~~
4

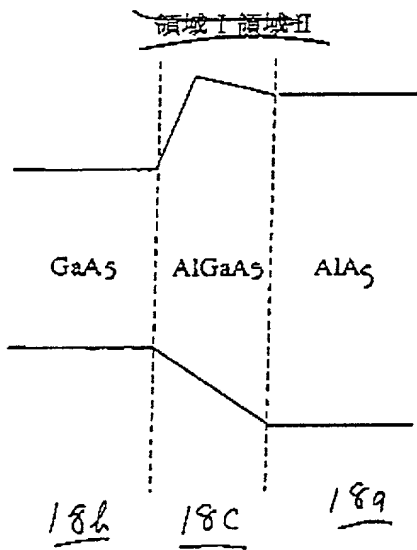
FIG 4



~~[図4]~~
5

~~図3~~

FIG 5

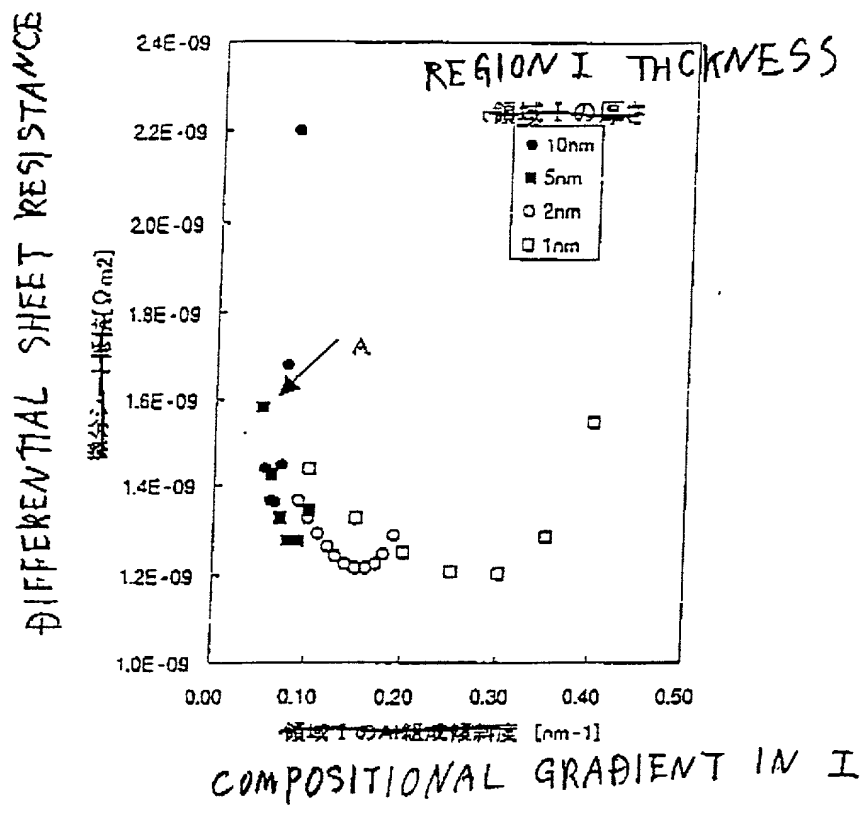


~~図4~~

10085204.022607

~~[X] 0~~

FIG 6



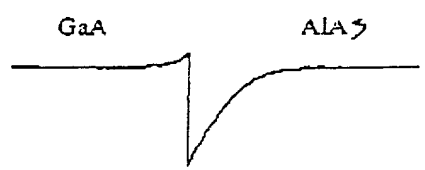
200220 40258001

~~[X] 7~~

FIG 7

~~[X] 8~~

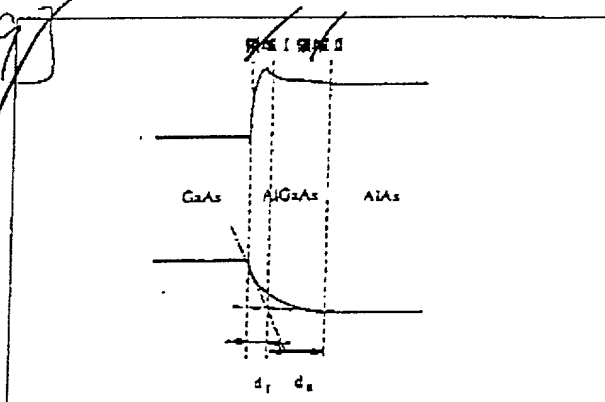
FIG 8



~~[X] 6~~

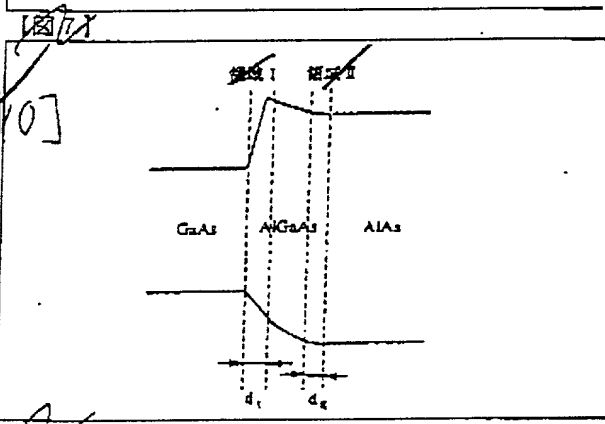
~~[X] 7~~

~~[179]~~



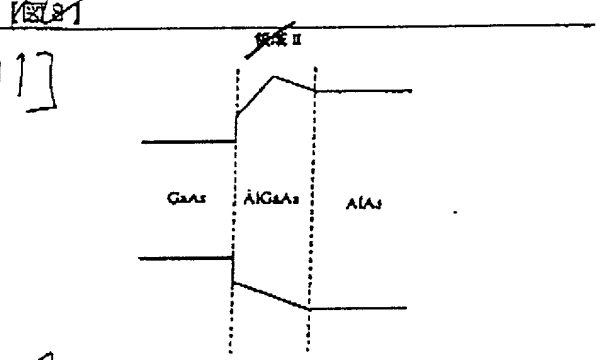
F1G9

~~[1710]~~



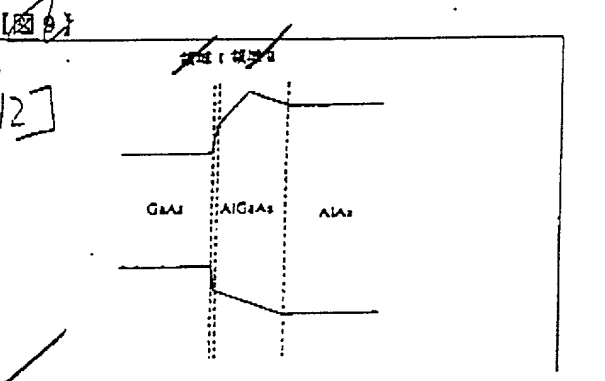
F1G10

~~[1711]~~



F1G11

~~[1712]~~



F1G12

~~[1710]~~

10035204 022000

FIG 13

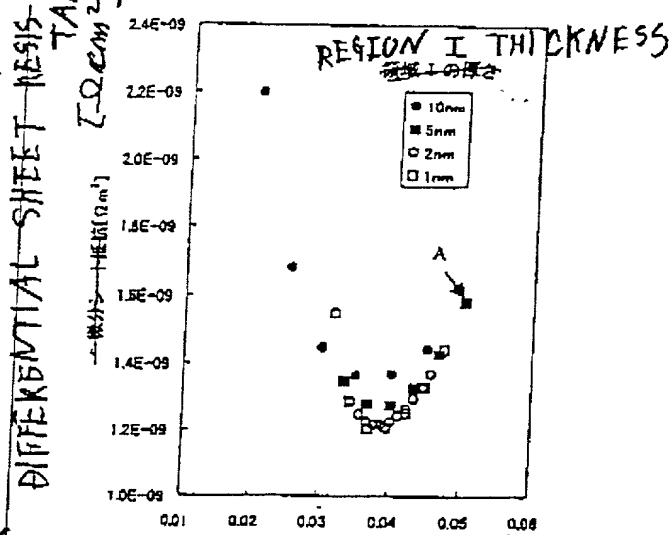


FIG 14

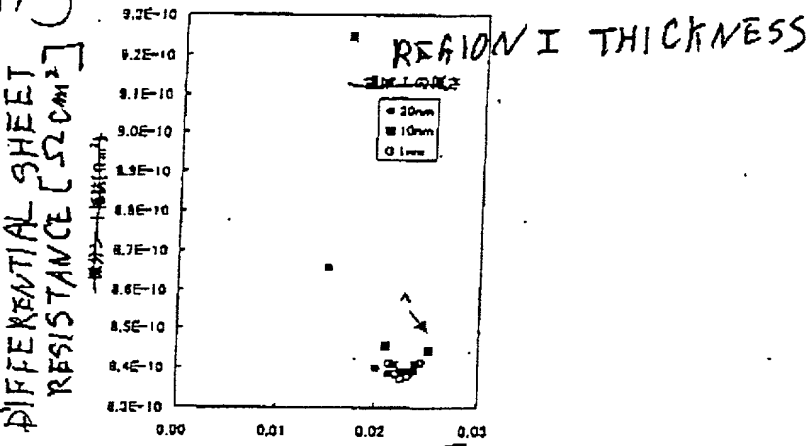
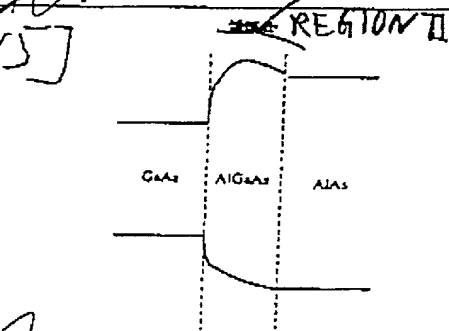


FIG 15



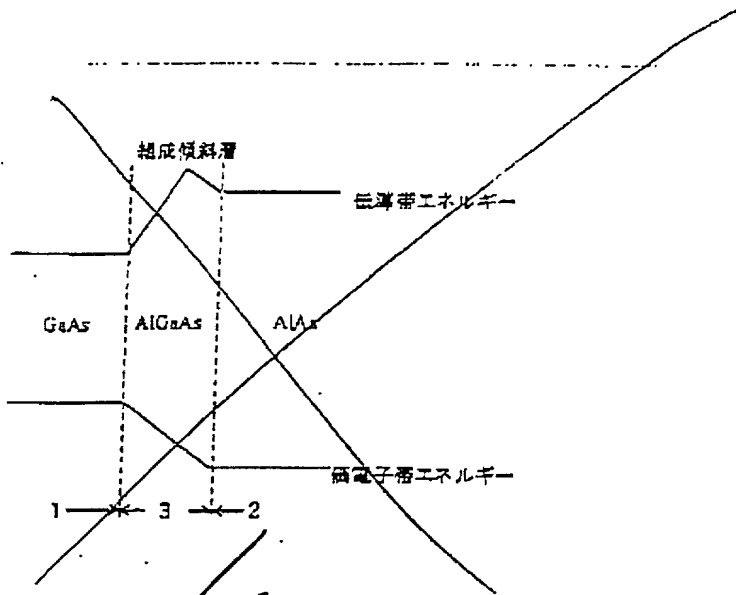


FIG 16

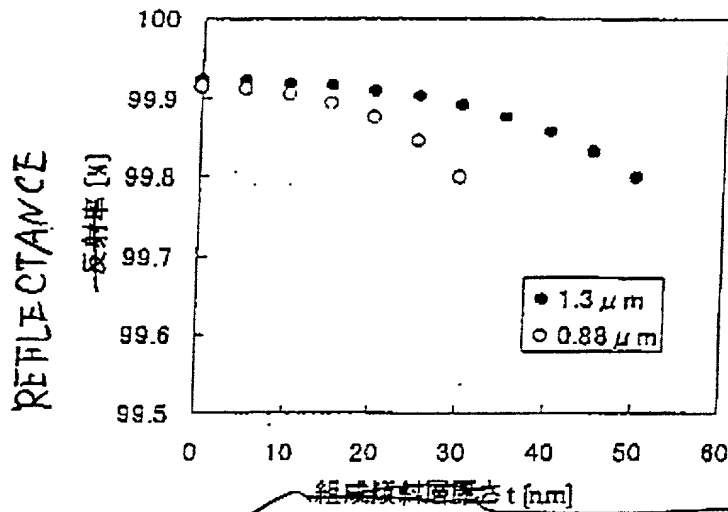
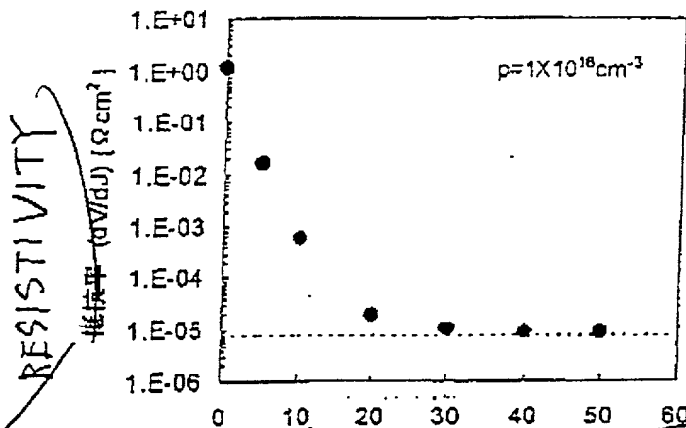


FIG 5

GRADIENT LAYER THICKNESS

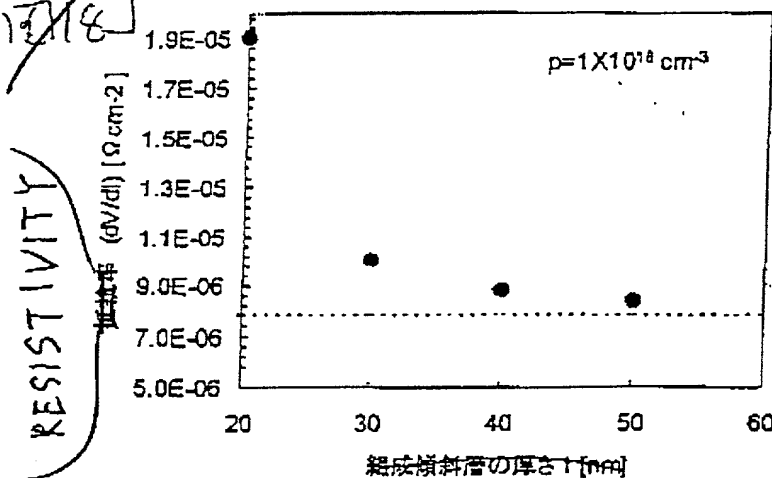
209220"40252001

[17] — FIG 17



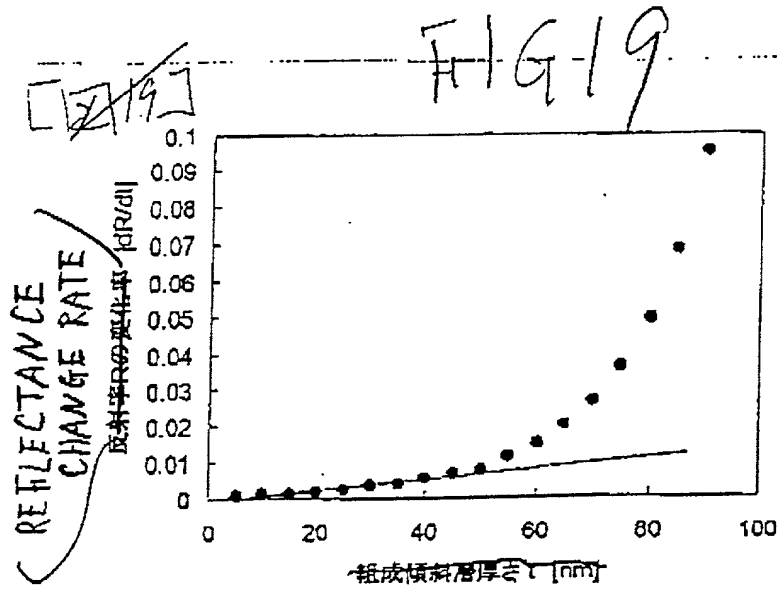
COMPOSITIONAL GRADATION LAYER THICKNESS
t [nm]

FIG 18



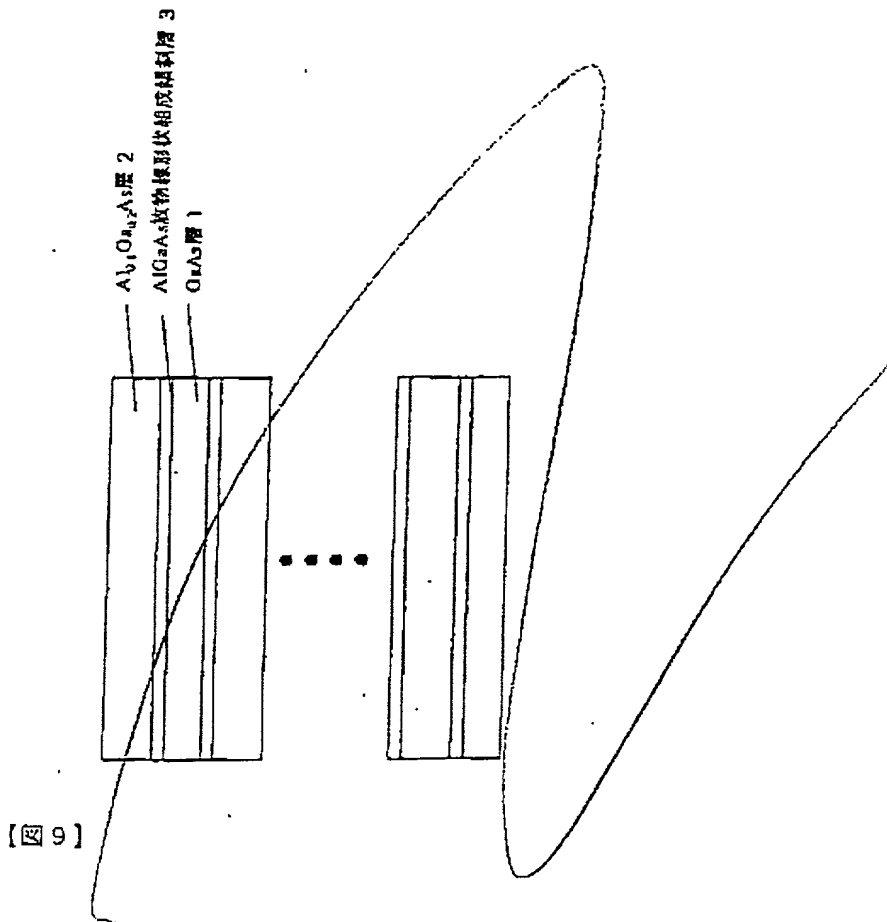
COMPOSITIONAL GRADATION LAYER
THICKNESS t [nm]

209220 40258001



COMPOSITIONAL GRADATION LAYER THICKNESS [nm]

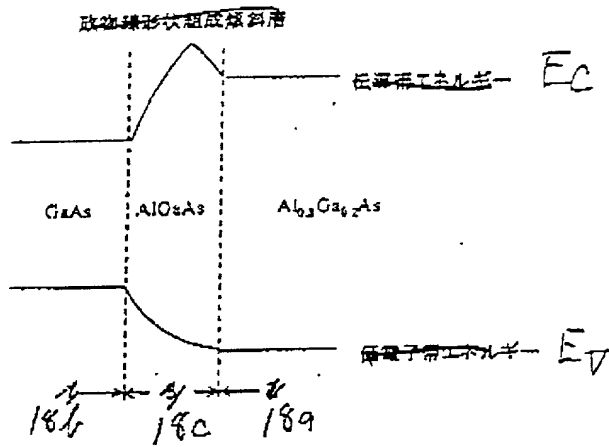
【図 8】



209220 40258001

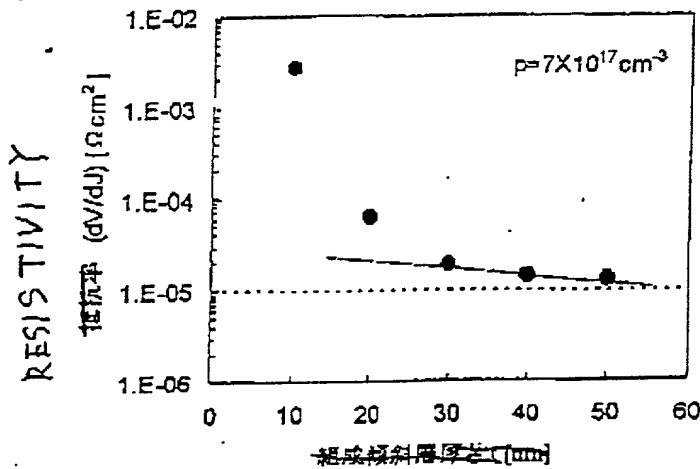
[20]

H1920



[21]
[10]

H1921



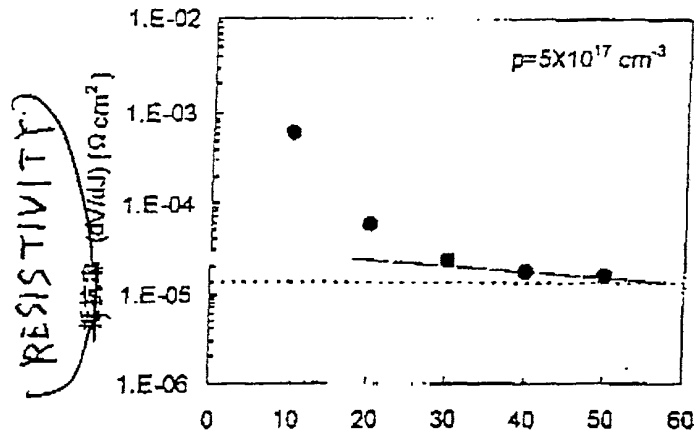
COMPOSITIONAL GRADATION LAYER THICKNESS

[図11]

[μm]

~~[FIG 22]~~

FIG 22



~~[FIG 23]~~

COMPOSITIONAL GRADATION LAYER THICKNESS [nm]

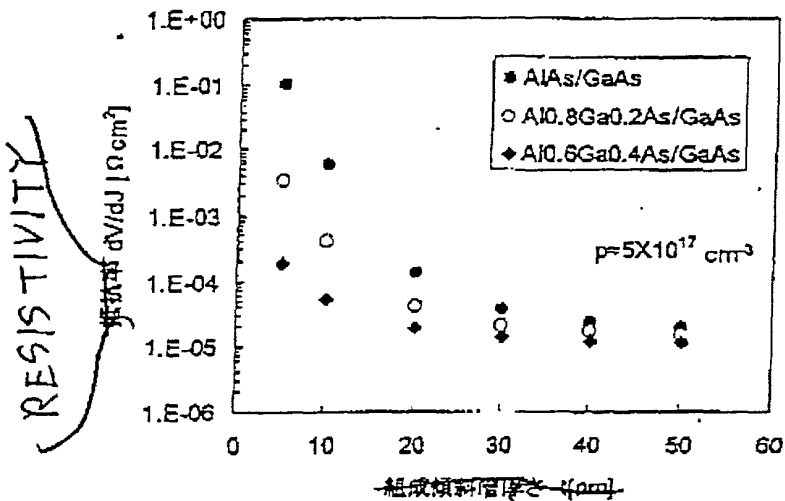


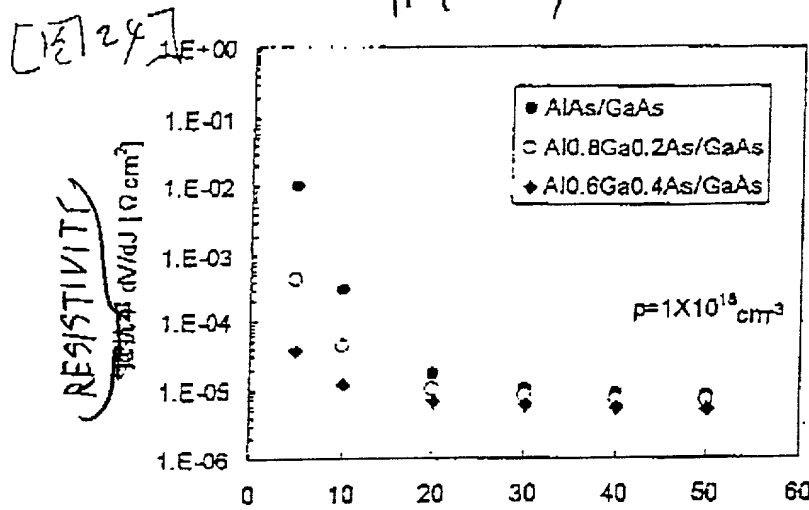
FIG 23

[FIG 13]

COMPOSITIONAL GRADATION LAYER THICKNESS [nm]

209220 4025802

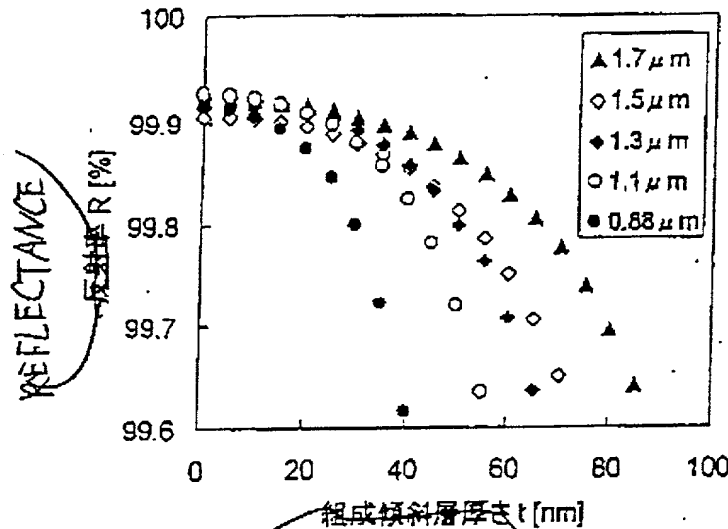
FIG 24



[FIG 25]
[FIG 4]

COMPOSITIONAL GRADATION LAYER THICKNESS

FIG 25



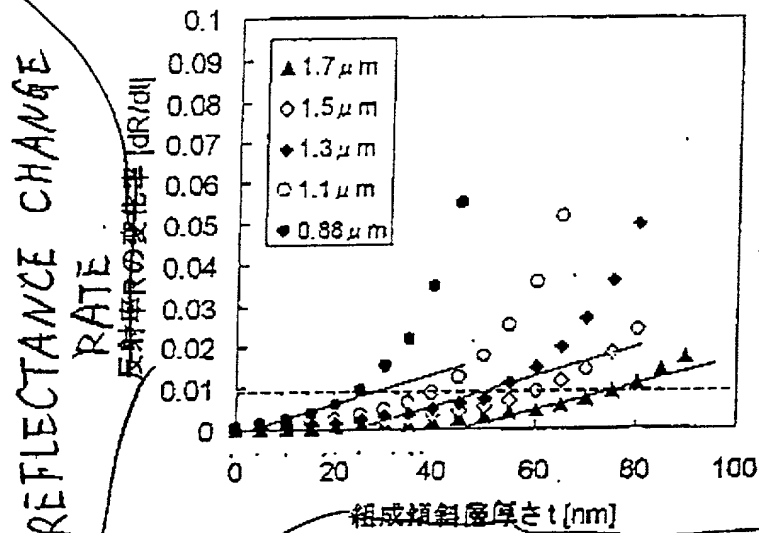
[FIG 15]

COMPOSITIONAL GRADATION LAYER THICKNESS

209220 40258001

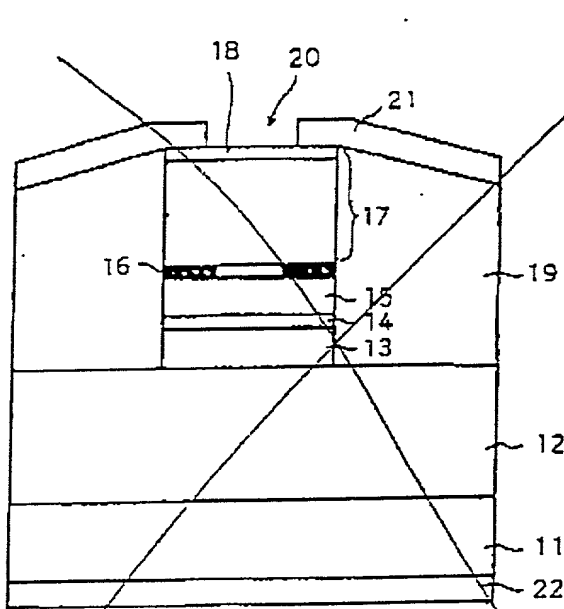
[13] 26

FIG 26



COMPOSITIONAL GRADATION LAYER THICKNESS

[図 16]



[図 17]

2022040258001

[1810]

27

FIG 27

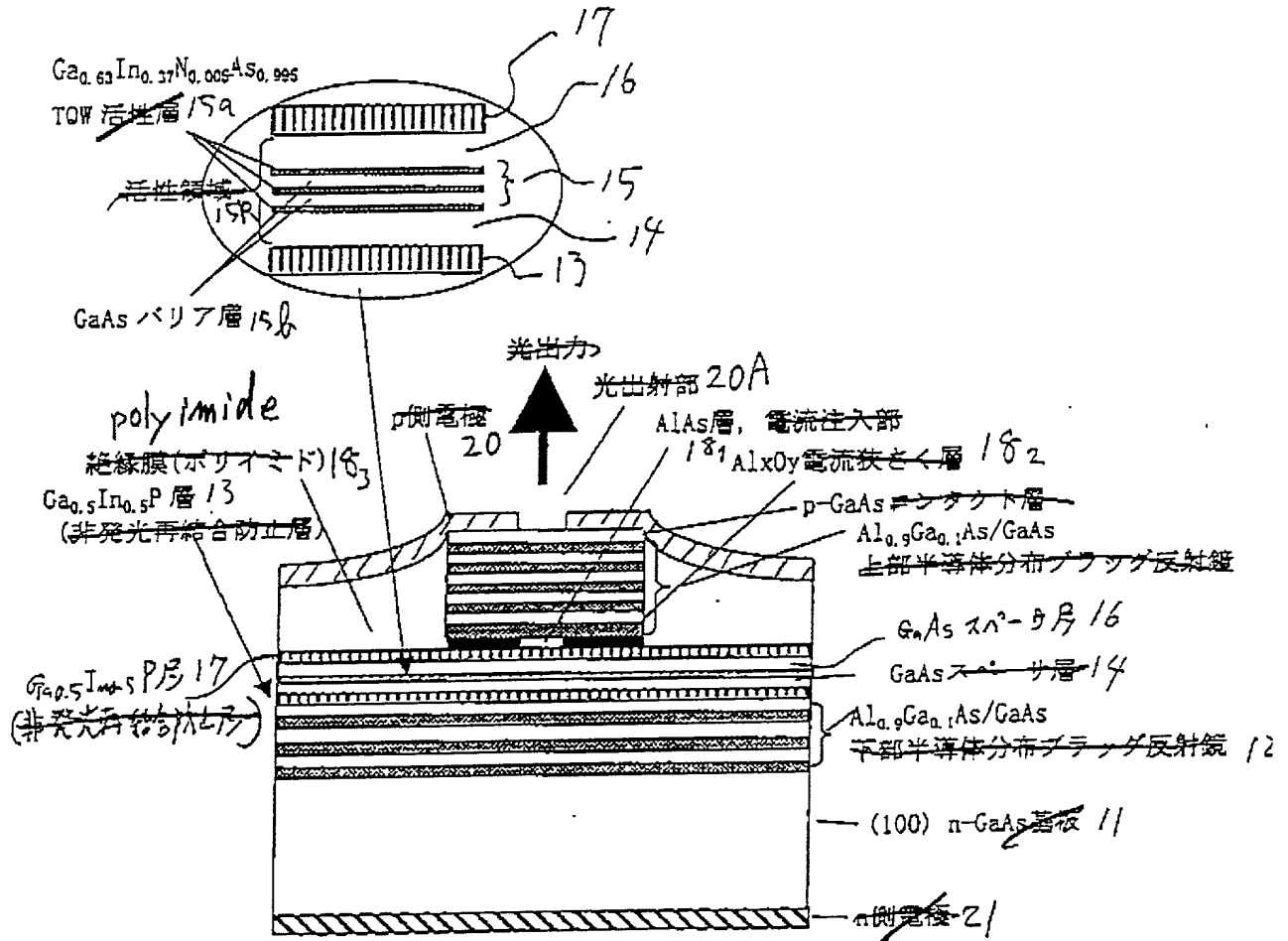


図 10

~~28~~
~~[1218]~~

FIG 28

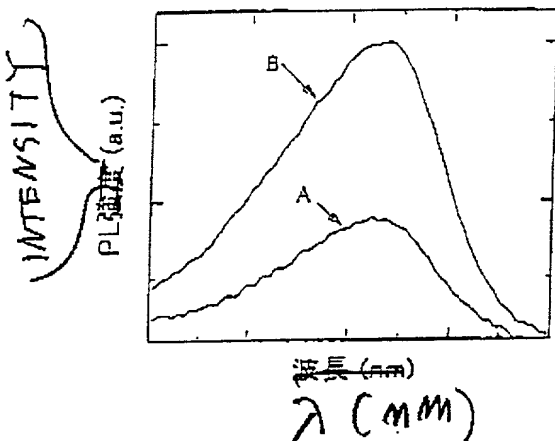


図 1 1

~~29~~
~~[1218]~~

FIG 29

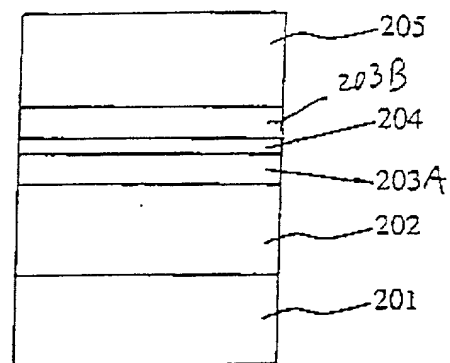


図 1 2

~~30~~
~~[1218]~~

FIG 30

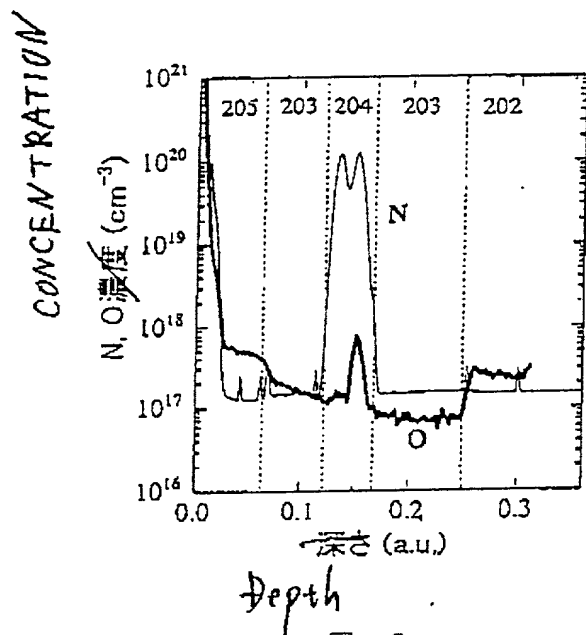
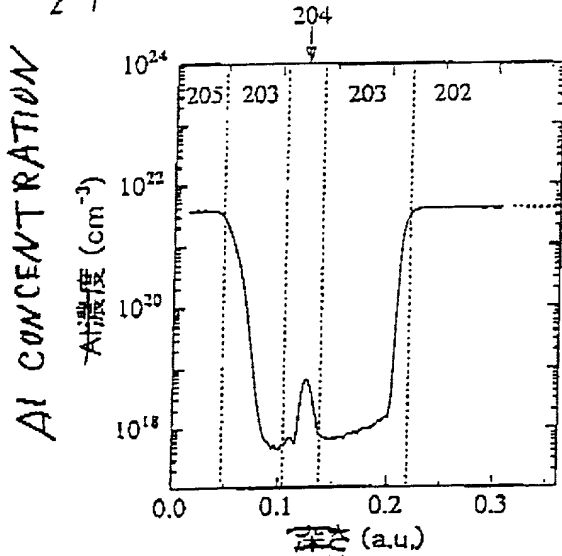


図 1 3

2009220-40258001

[~~FIG 31~~]
31

FIG 31

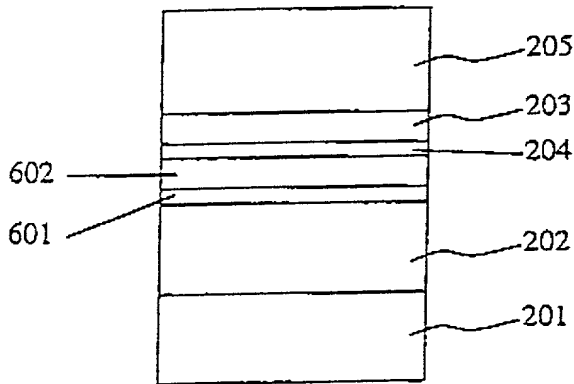


飽和レベル SATURATION

深さ (a.u.)
Depth
~~FIG 14~~

[~~FIG 32~~]
32

FIG 32



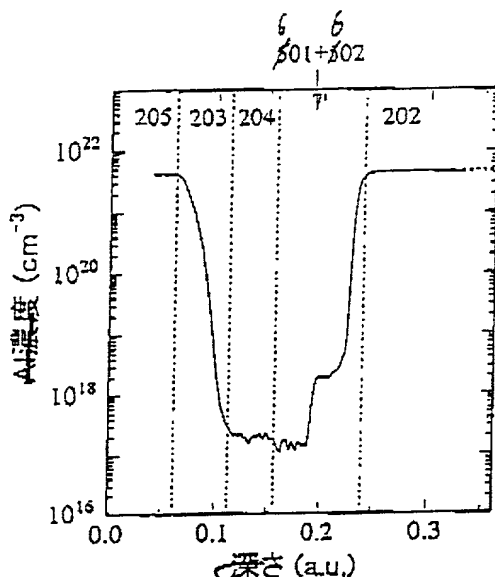
~~FIG 15~~

209220 40258001

33
[~~18~~]

FIG 33

Al CONCENTRATION



SATURATION

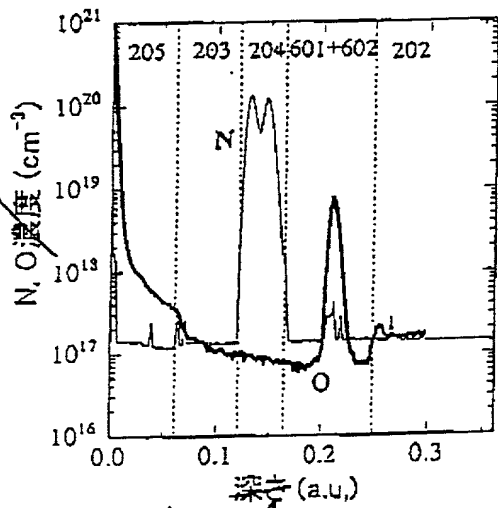
Depth 深さ (a.u.)

~~図 16~~

34
[~~19~~]

FIG 34

CONCENTRATION



Depth 深さ (a.u.)

~~図 17~~

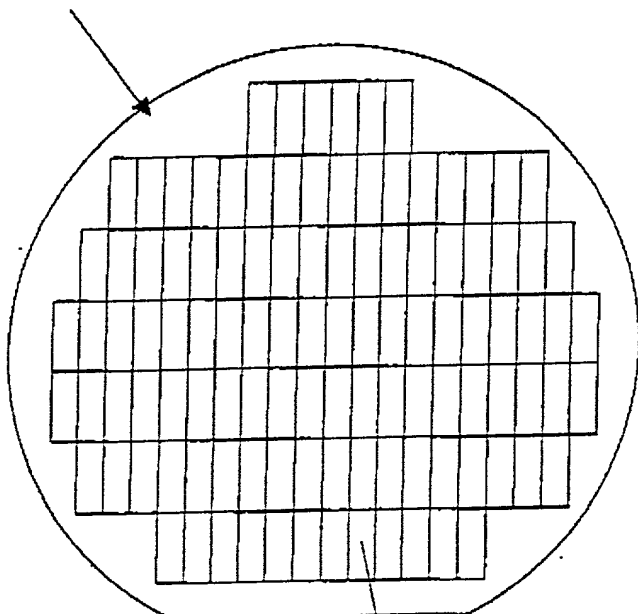
209220 40258001

93

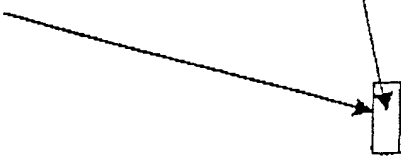
35/
☒ 18

FIG 35

~~ドーパ素子を形成した (100) n-GaAs ウェハ~~ 31



~~ドーパ素子チップ~~ 32



~~図 18~~

409220 40258001

36
~~[36]~~

F/G36

33

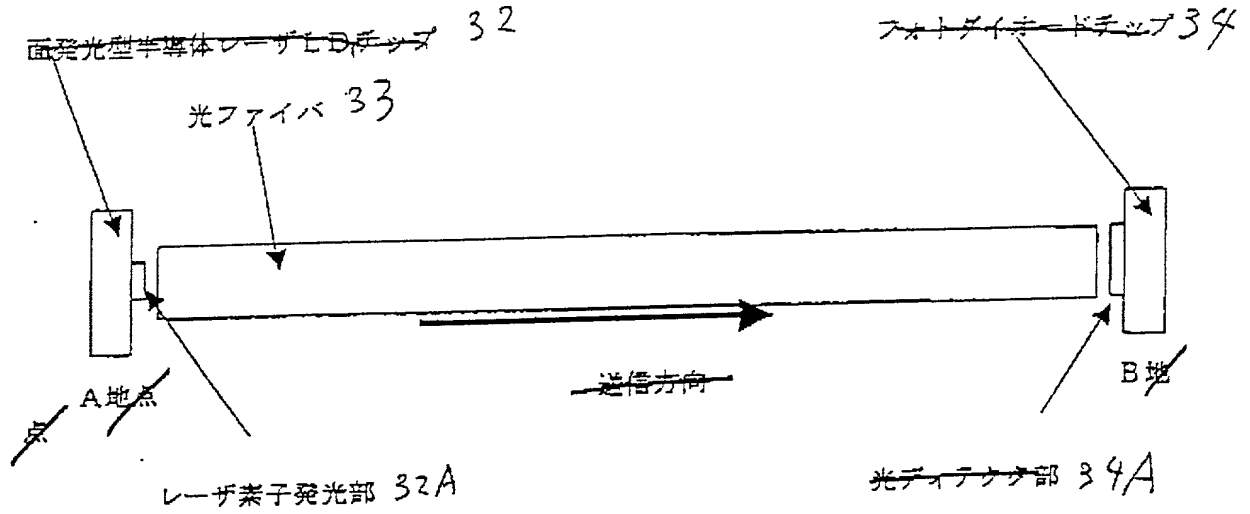


図 19

37
~~[37]~~

F/G37

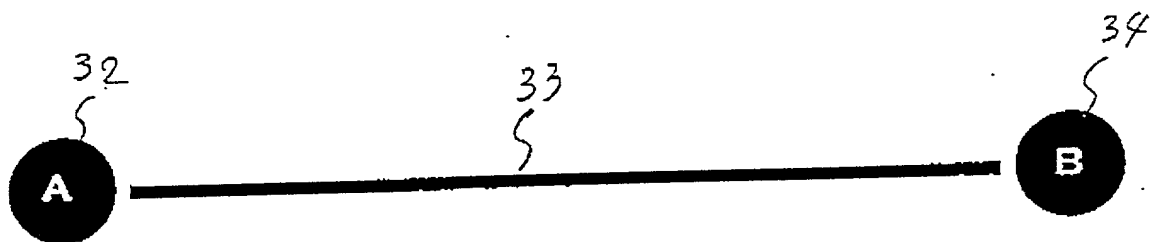


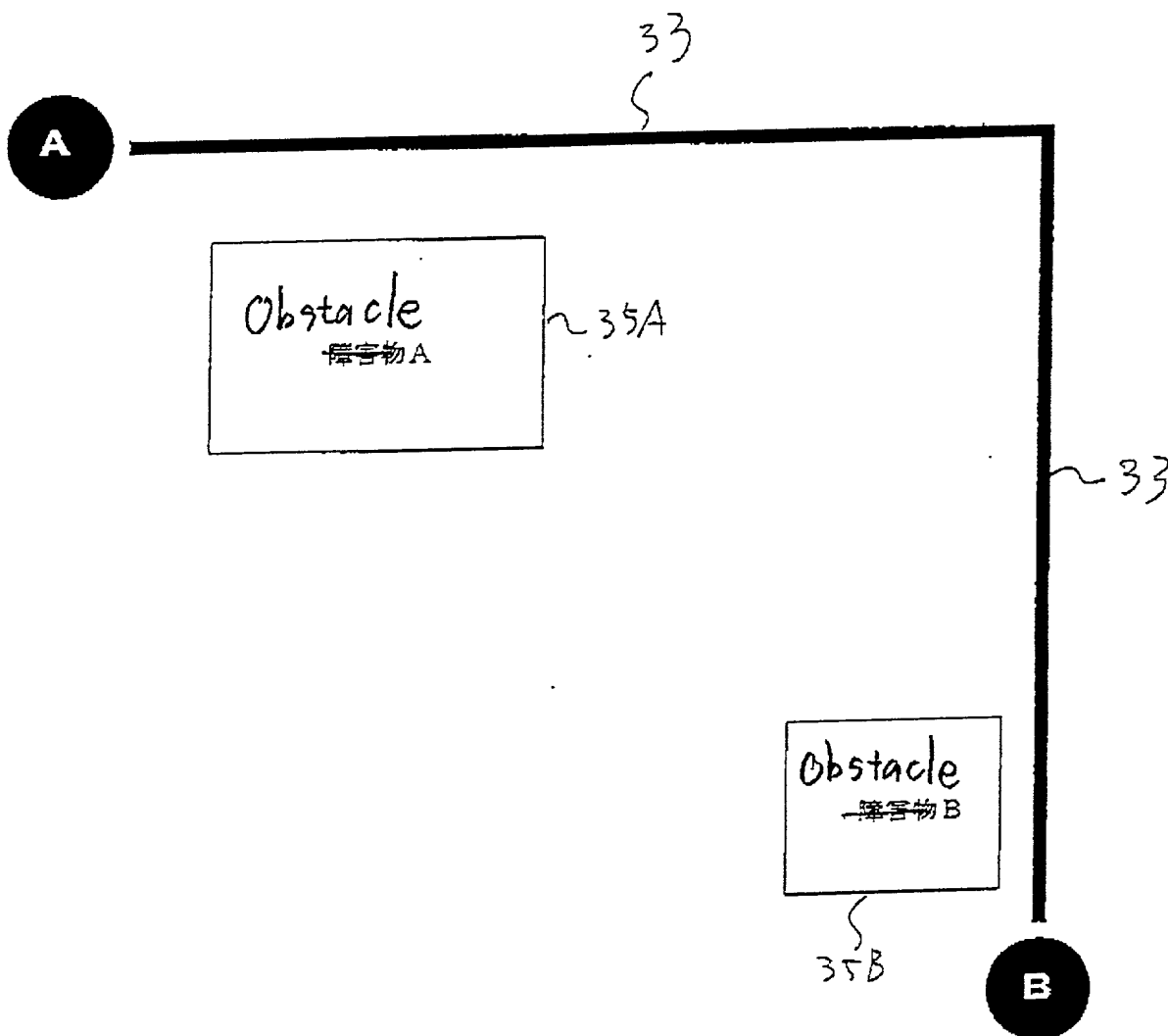
図 20

209220"40258007

3

38
~~21~~

HIG 38



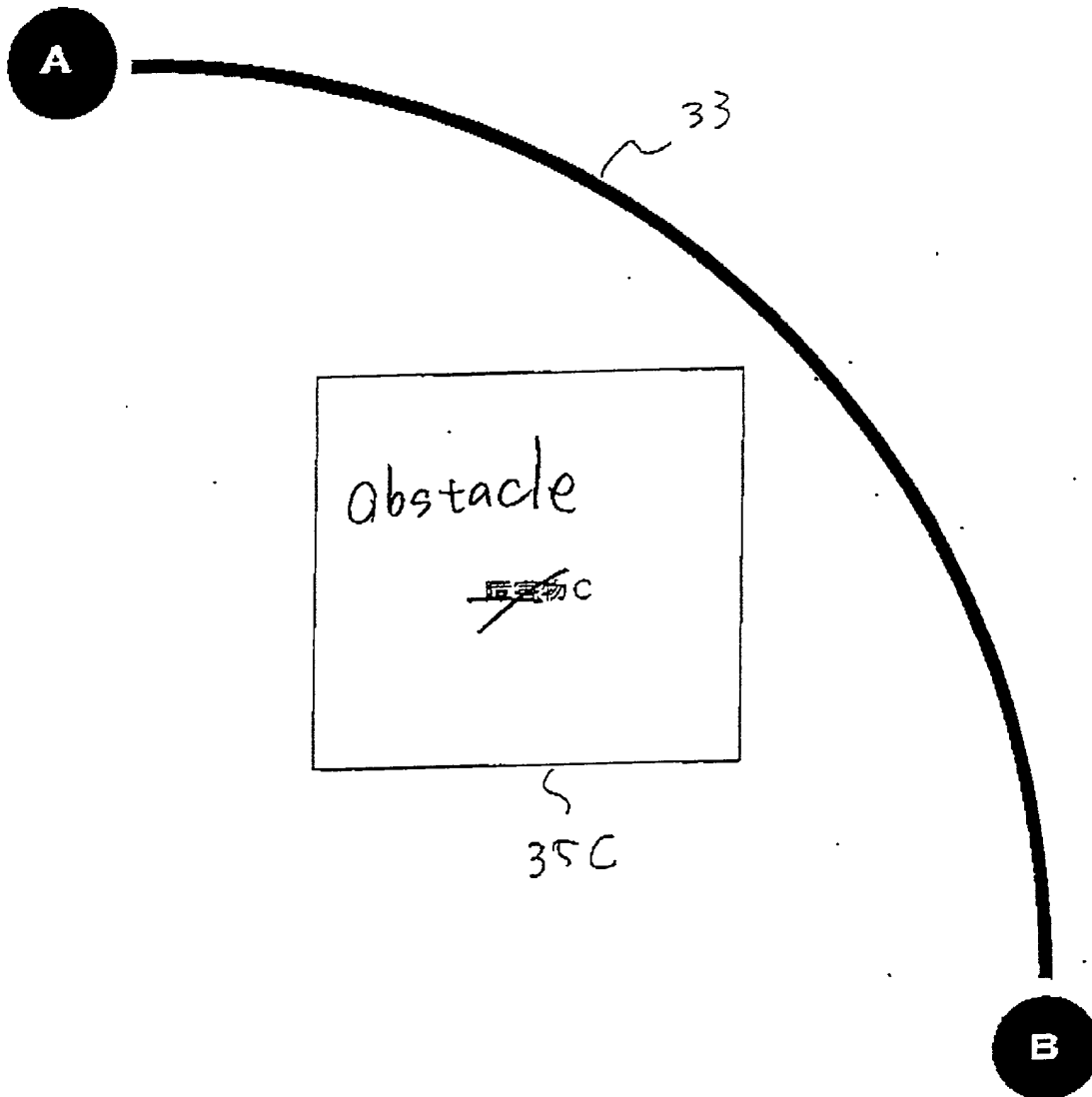
~~21~~

1008504.02200

33

31
[13] 24

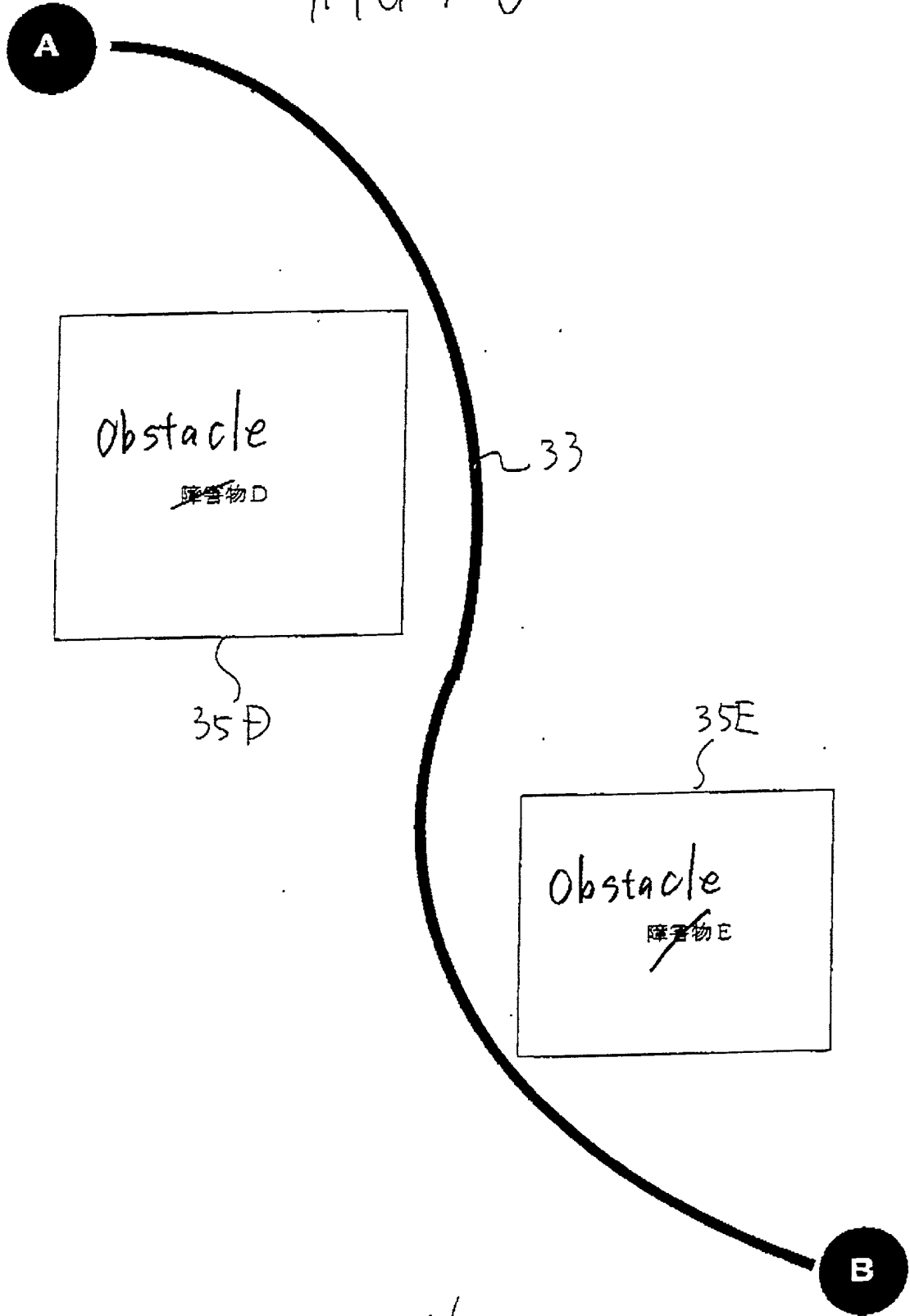
FIG 39



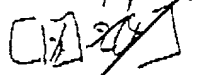
2002220 4025800T

FIG 40

3



23

41


F194/

914

~~面発光型半導体レーザユニット~~ 32

光ファイバ F1

~~反射部材~~ R

~~送信方向~~

~~半導体発光部~~ 32A

送信方向

光ファイバ F2

光ディテクタ部
34A

~~フォトダイオード~~ 34

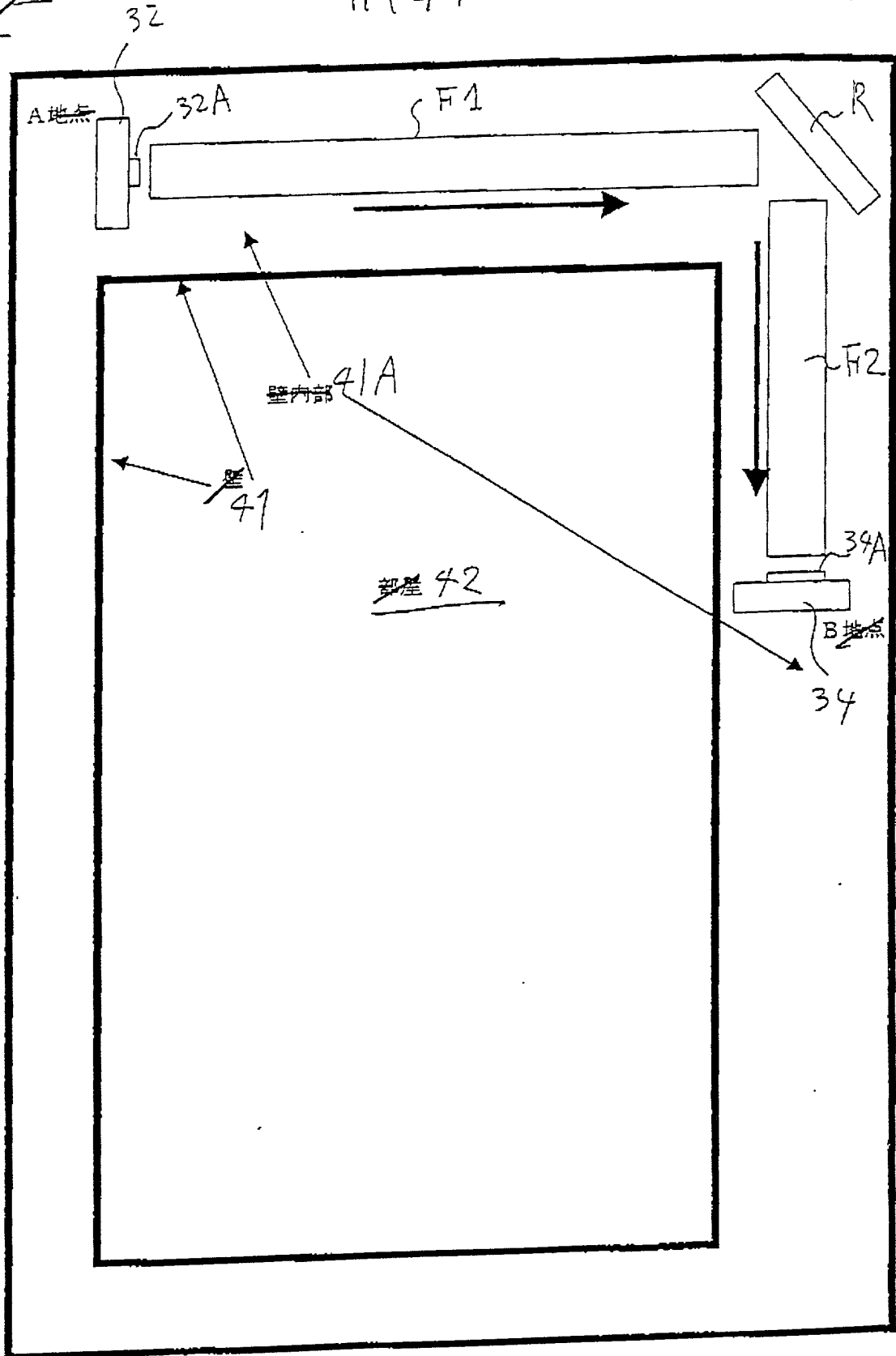
図 24

202204025001

LIX 140
42

HIG42

44



425

209220 40253001

図 26
43

F/G 43

44

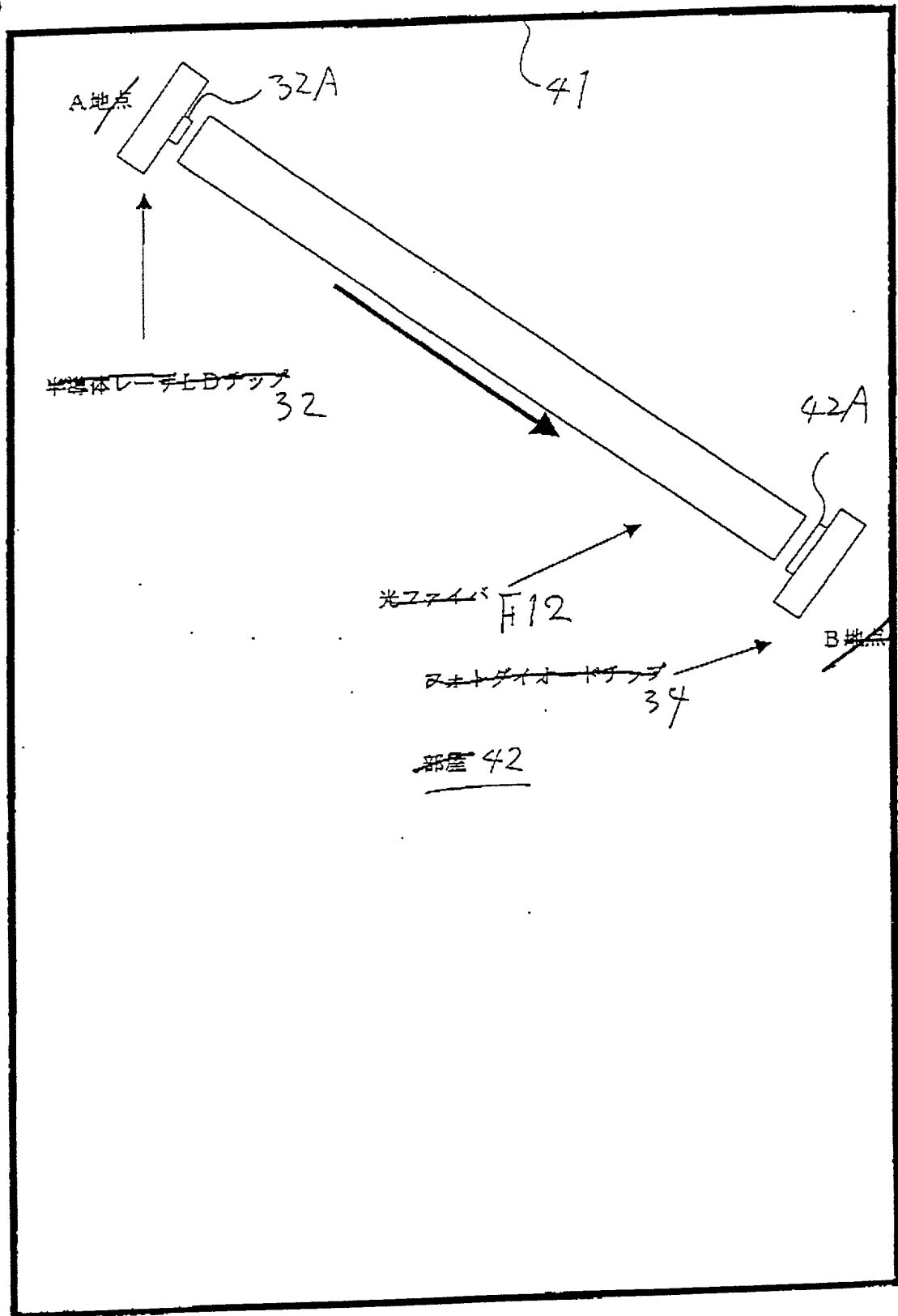


図 26

1005204.022602

FIG 44
 44

FIG 44

44

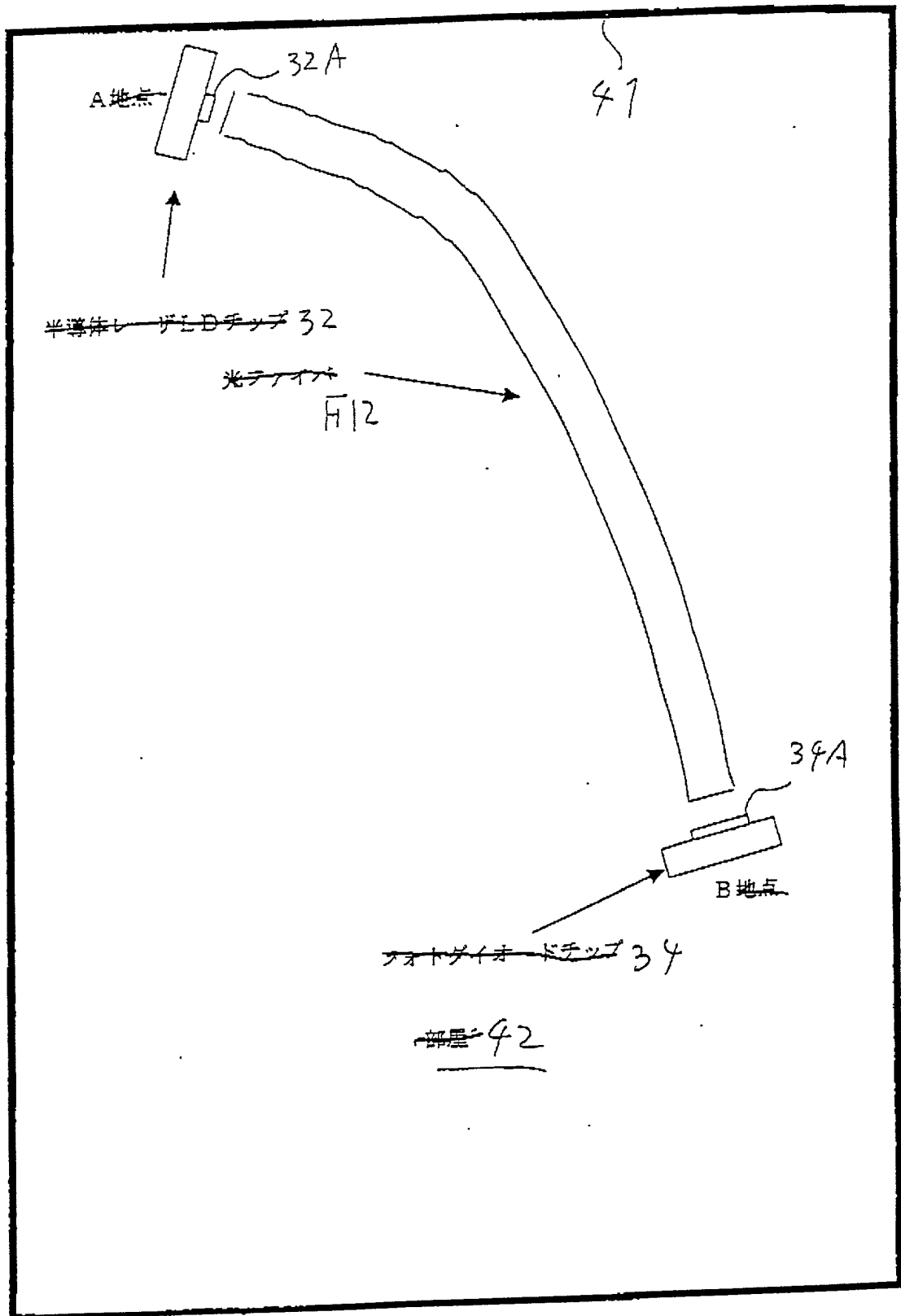


FIG 44

94

~~図 28~~
 45

FIG 45

~~面発光型半導体レーザーチップ 32~~

~~フォトダイオードチップ 34~~

レーザ素子発光部 32A

~~光ディテクタ部 34A~~

送信方向

~~図 29~~
 46

FIG 46

~~面発光型半導体レーザーチップ 32~~

反射部材 R

送信方向

~~レーザ素子発光部 32A~~

送信方向

~~光ディテクタ部 34A~~

~~フォトダイオードチップ 34~~

~~図 29~~
 1a

209220 40258001 10092204 022602

~~47~~
~~[12] 30~~ FIG 47

15

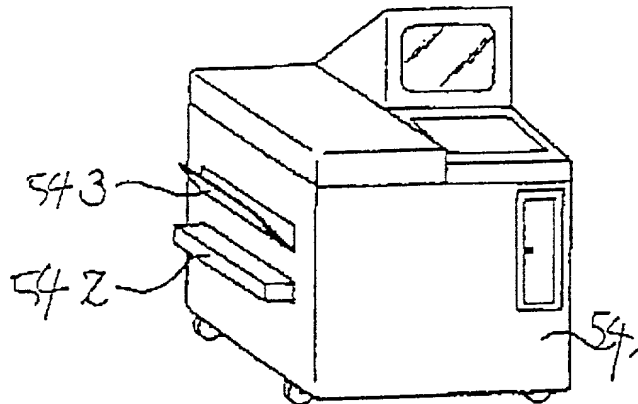
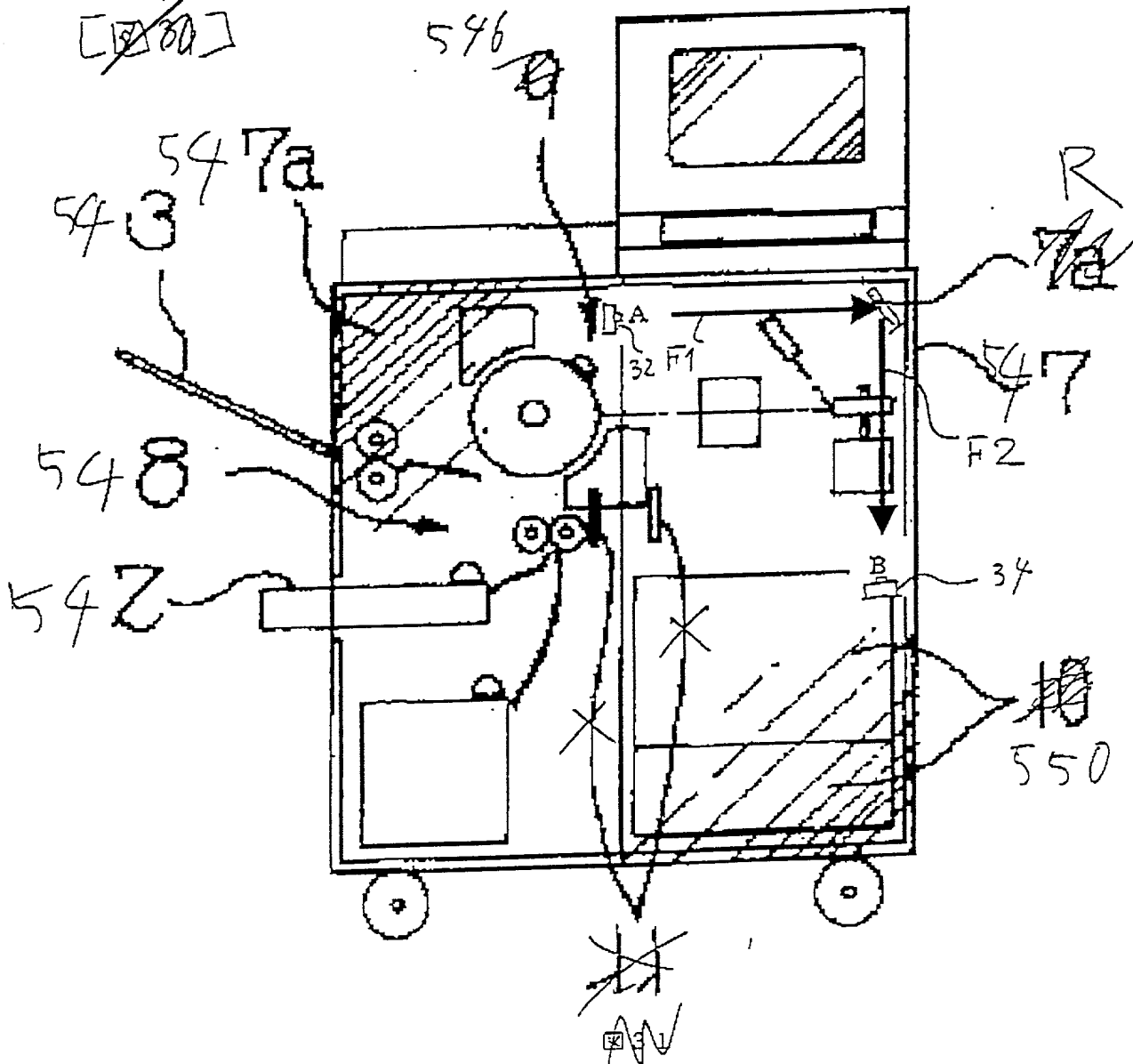


FIG 48

~~48~~
~~[12] 30~~

546



45

49
~~[12/32]~~

FIG 49

551

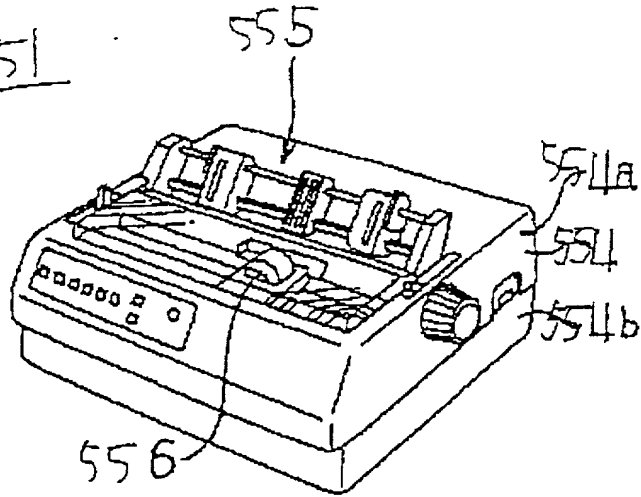
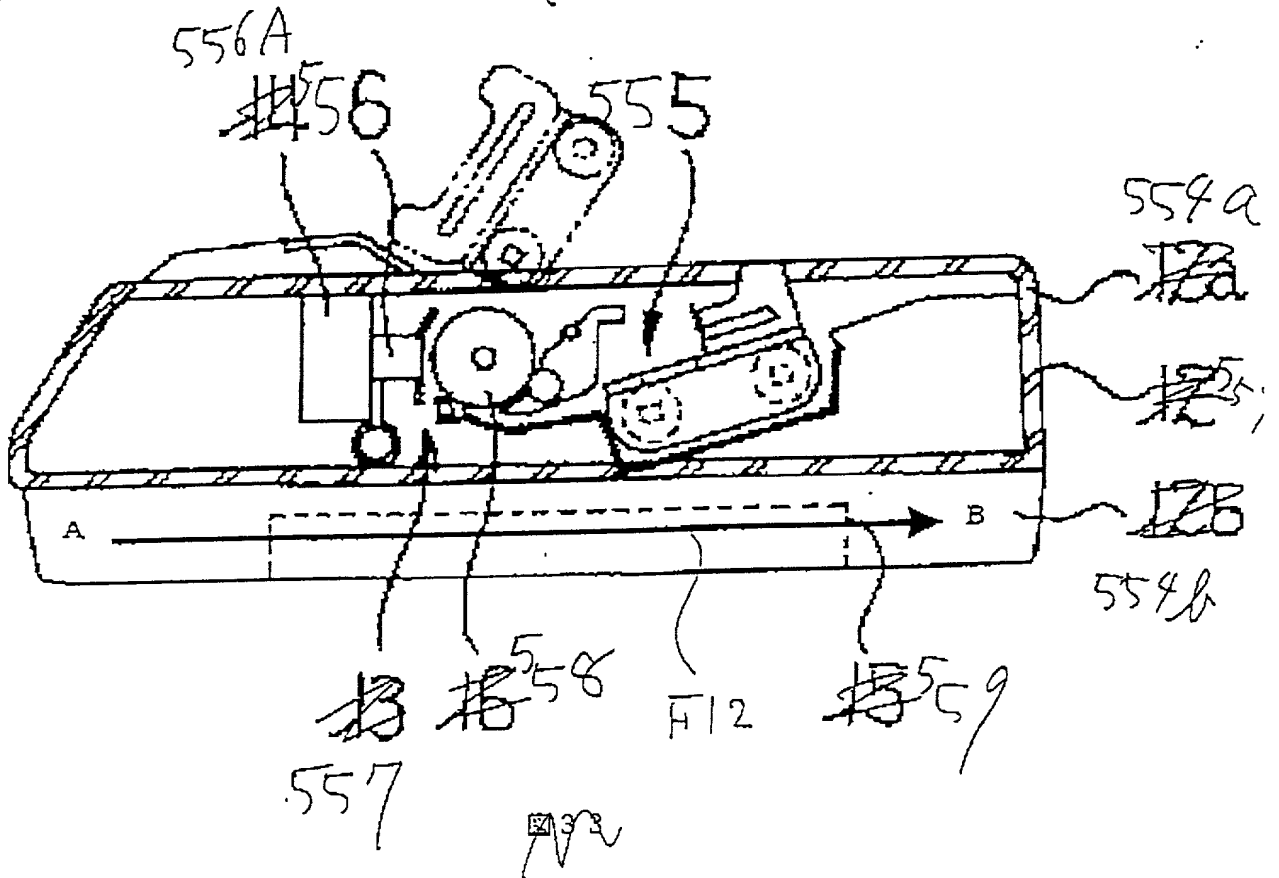


FIG 50

50
~~[12/33]~~

32



209220 40258001

96

51
 [12] 34

FIG 51

面発光型半導体レーザLEDチップ 32

反射部材 R

カバー 32B

送信方向

F1

量子発光部 32A

A

送信方向

F2

34B

光アイソレータ部 34A

フォトダイオードチップ 34

34

B

34

209220 40258001

54
~~35~~

FIG 52

7 &
2

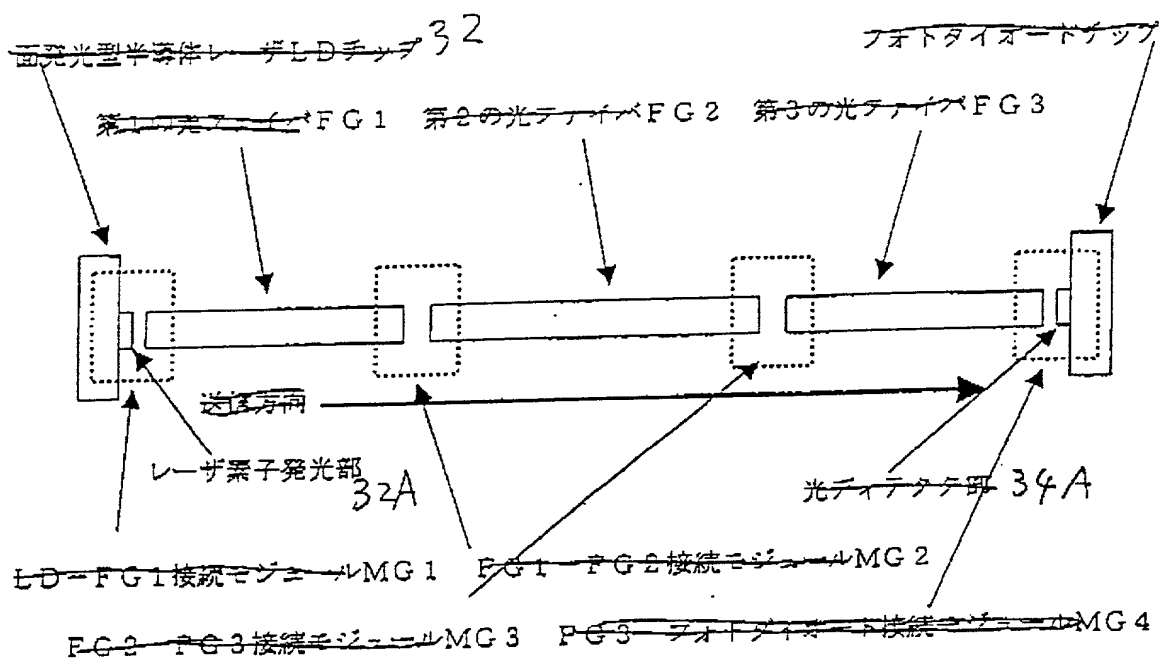


図 52

10085204.02602

[図 35]

FIG 53

37

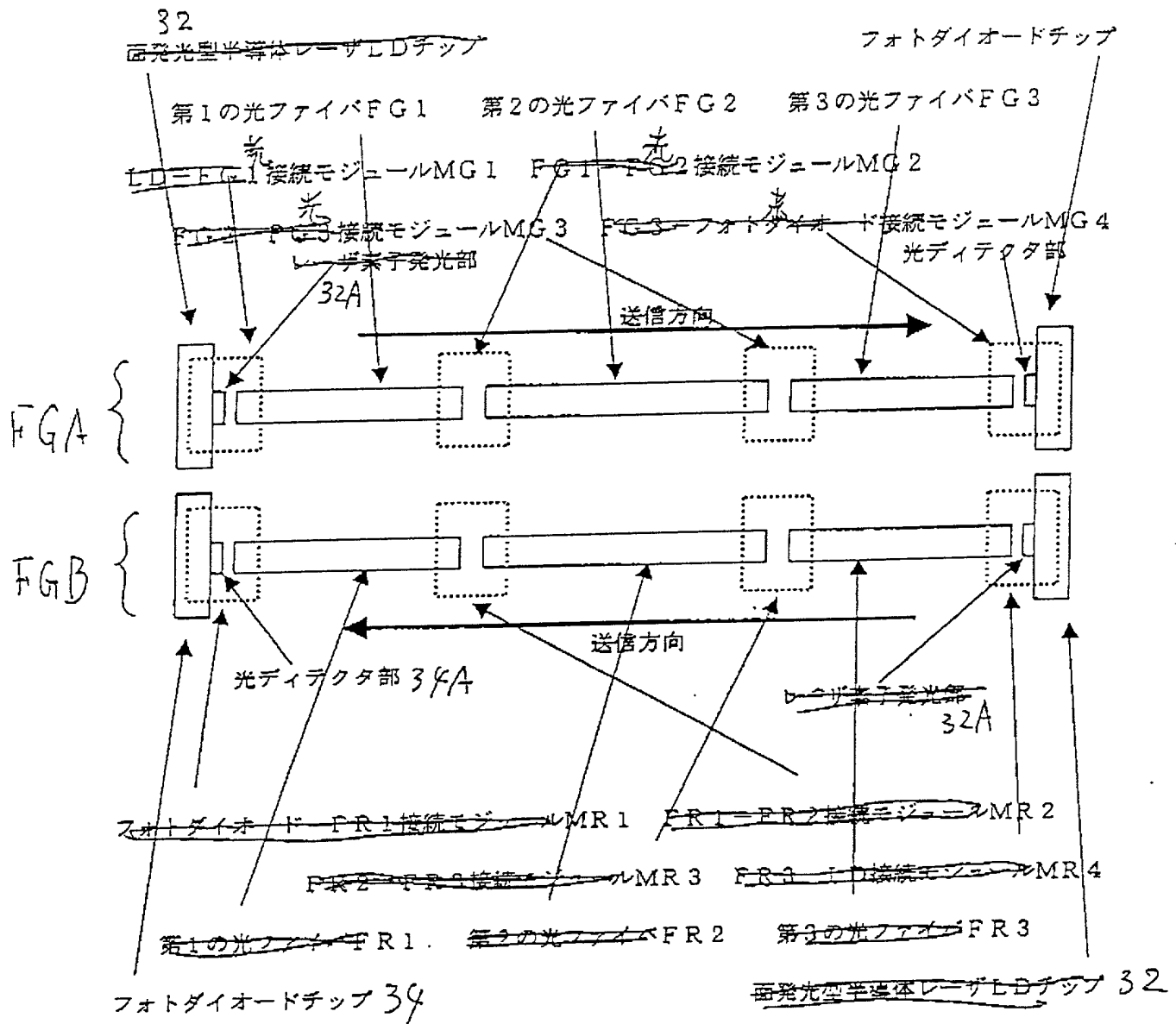
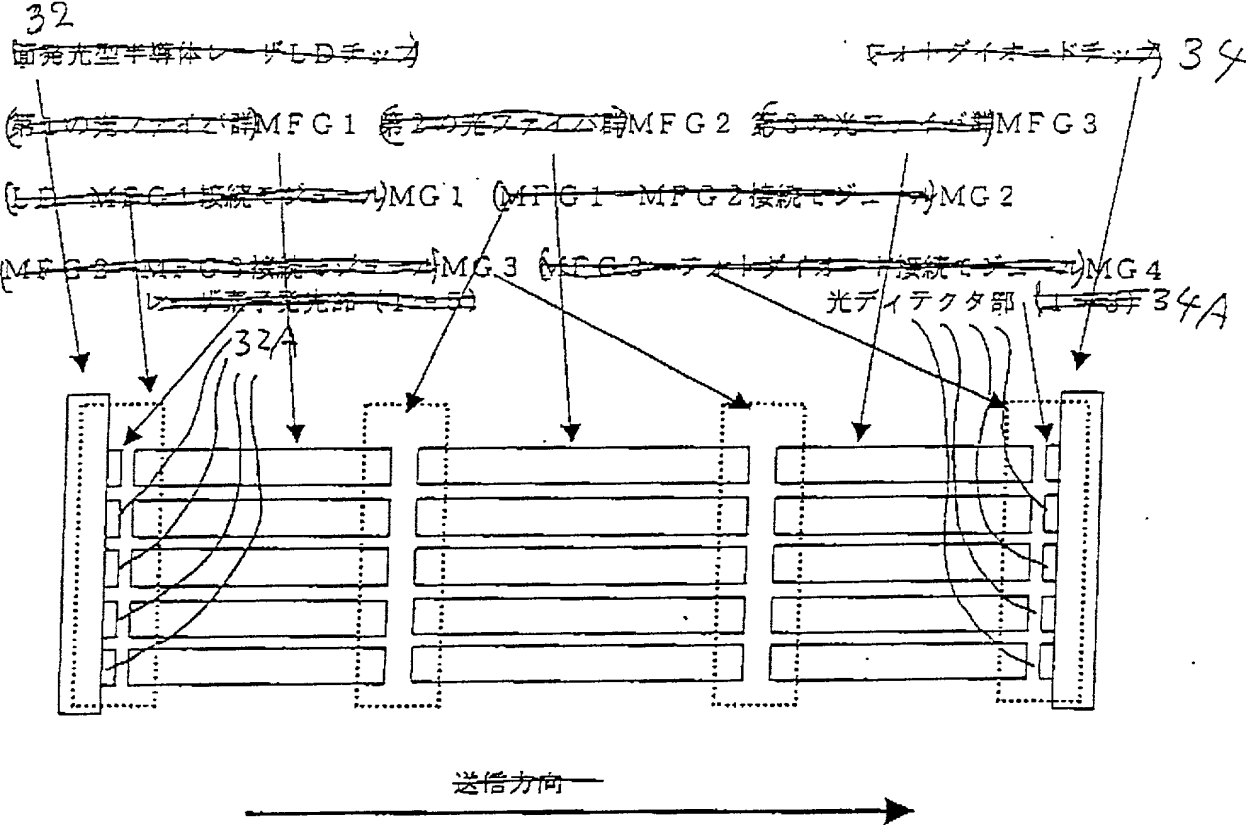


図 35

~~図34~~

H1G54

47



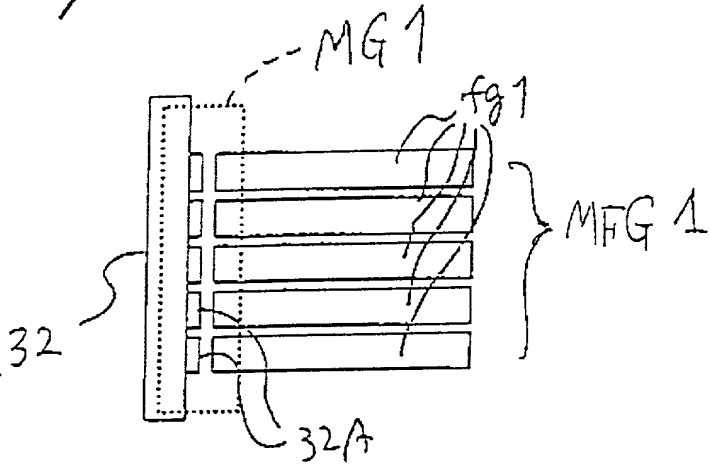
~~図37~~

209220 40258001

~~55~~
~~38~~

H1955

78



38
EVC

209220 40258007

[12] 356

H1G56

カ8

LDチップホルダ

ファイバホルダ

61

62

10085204 022500

32

32A

挿入

FG1

32A

fg1

89

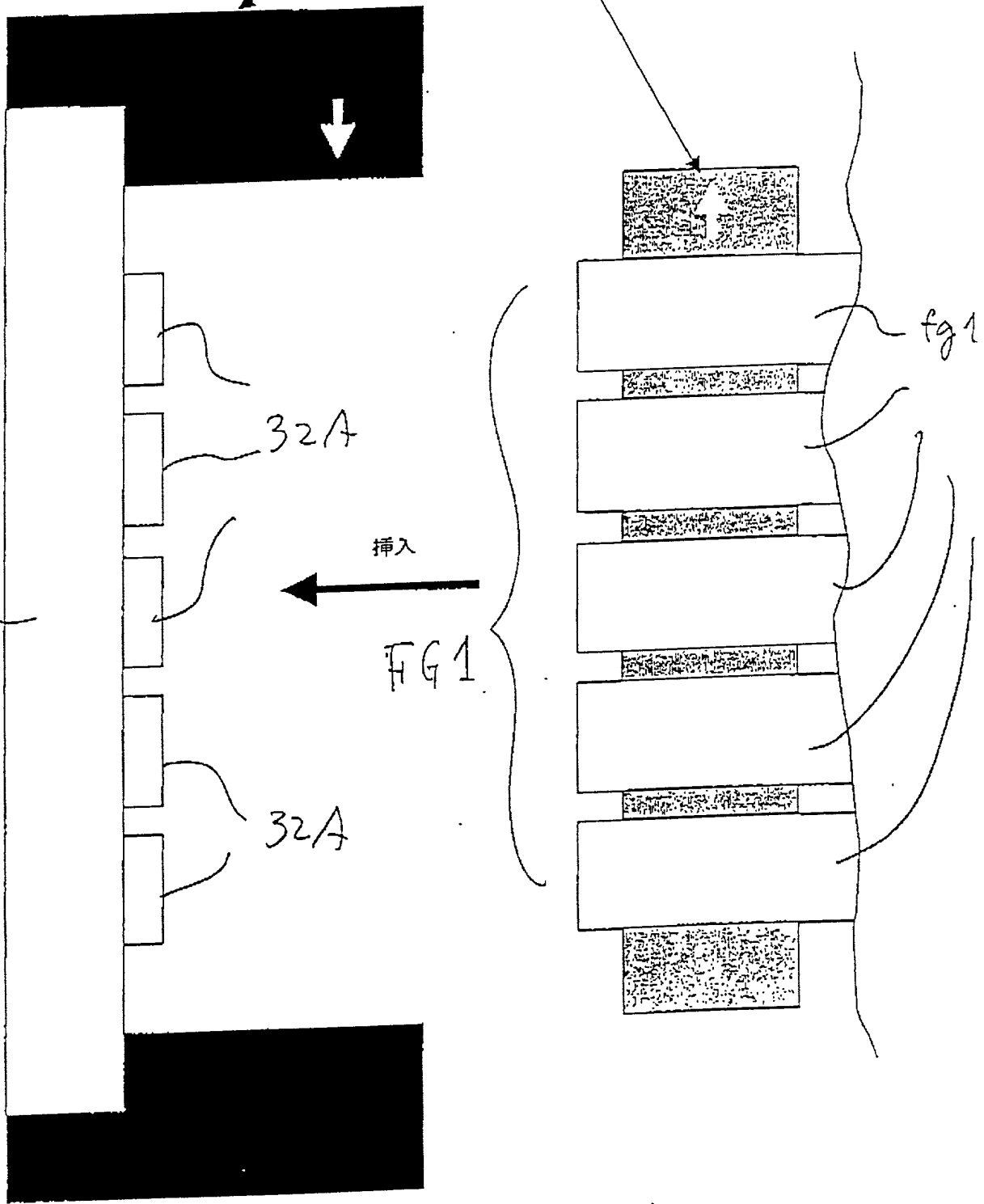
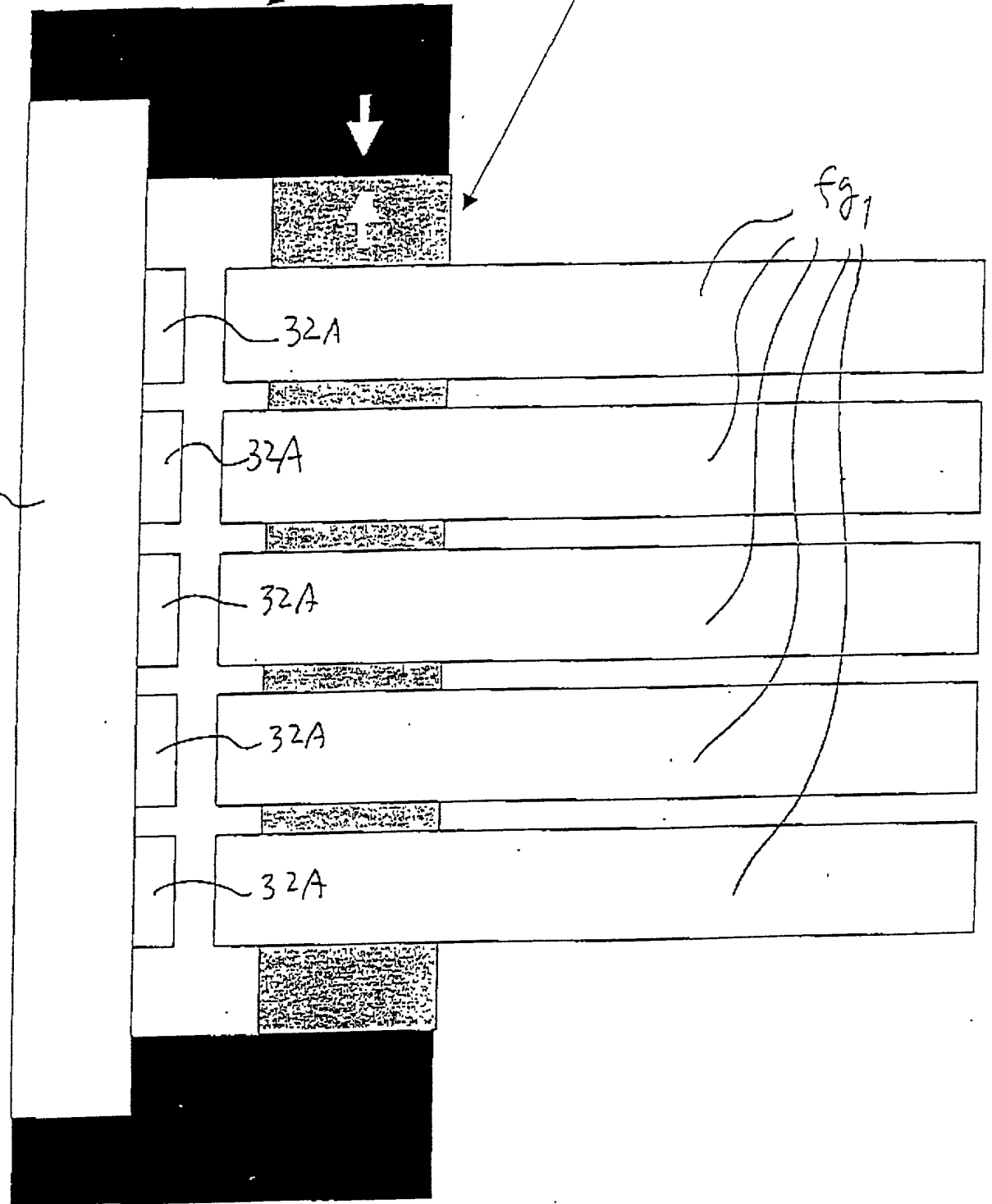


FIG 57
57

88

LDミツフホルダ 61

ファイバホルダ 62



32

fg1

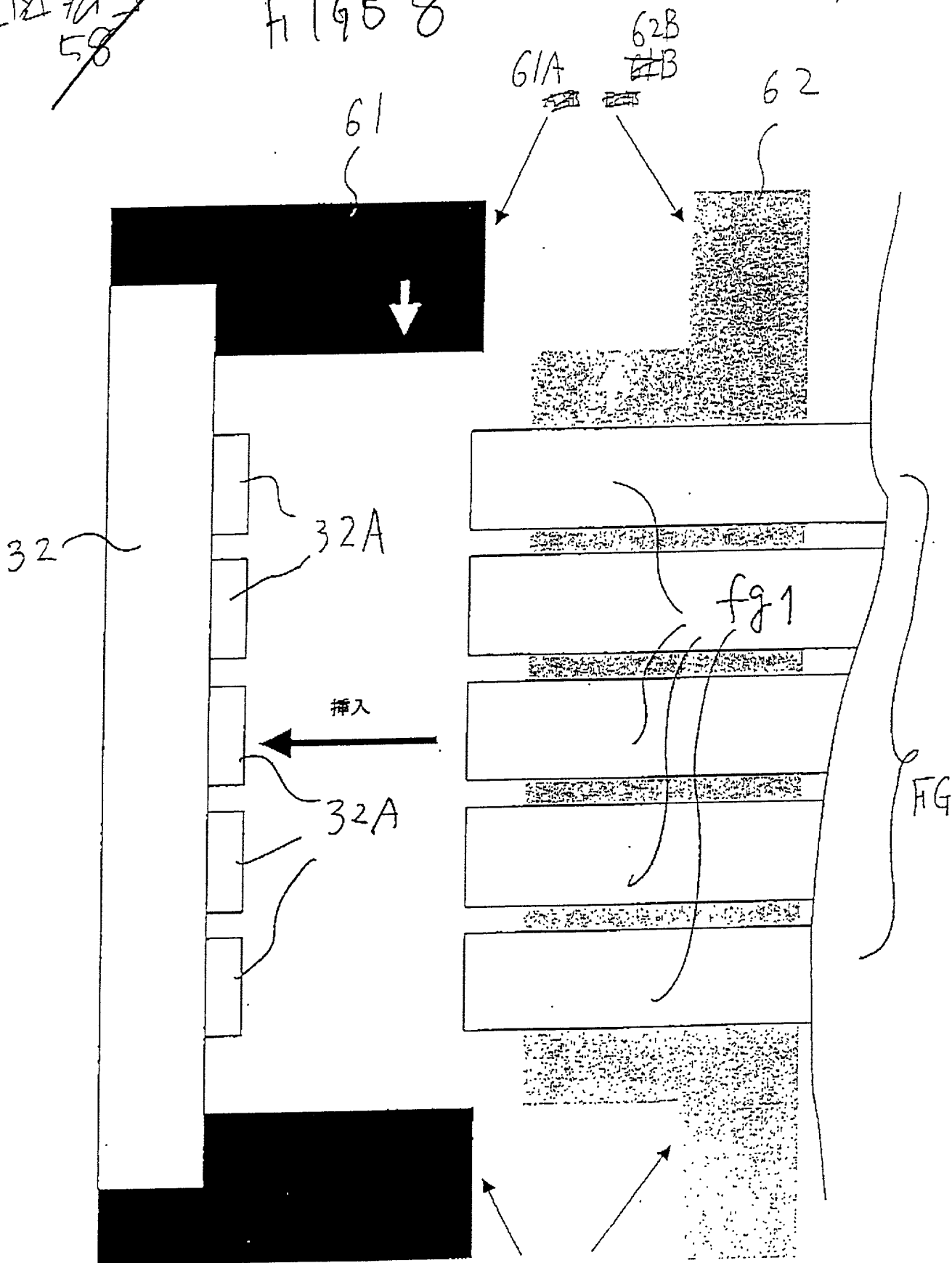
10085204 022600

40

[12] 41
 58

F1G58

8



209220' 4025800T

741

61A 62B

A8

[12] 12
57

FIG 59

61

62

32

32A

fg 1

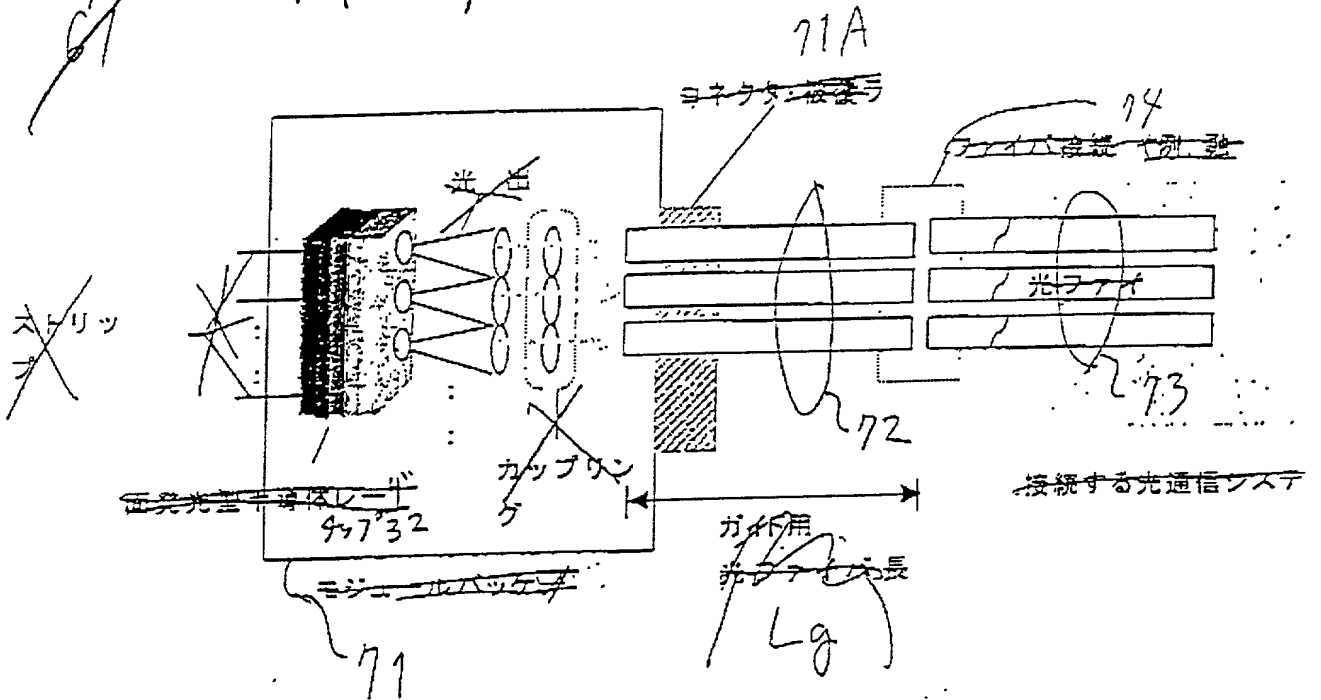
MFG 1

FIG 2

~~FIG 61~~

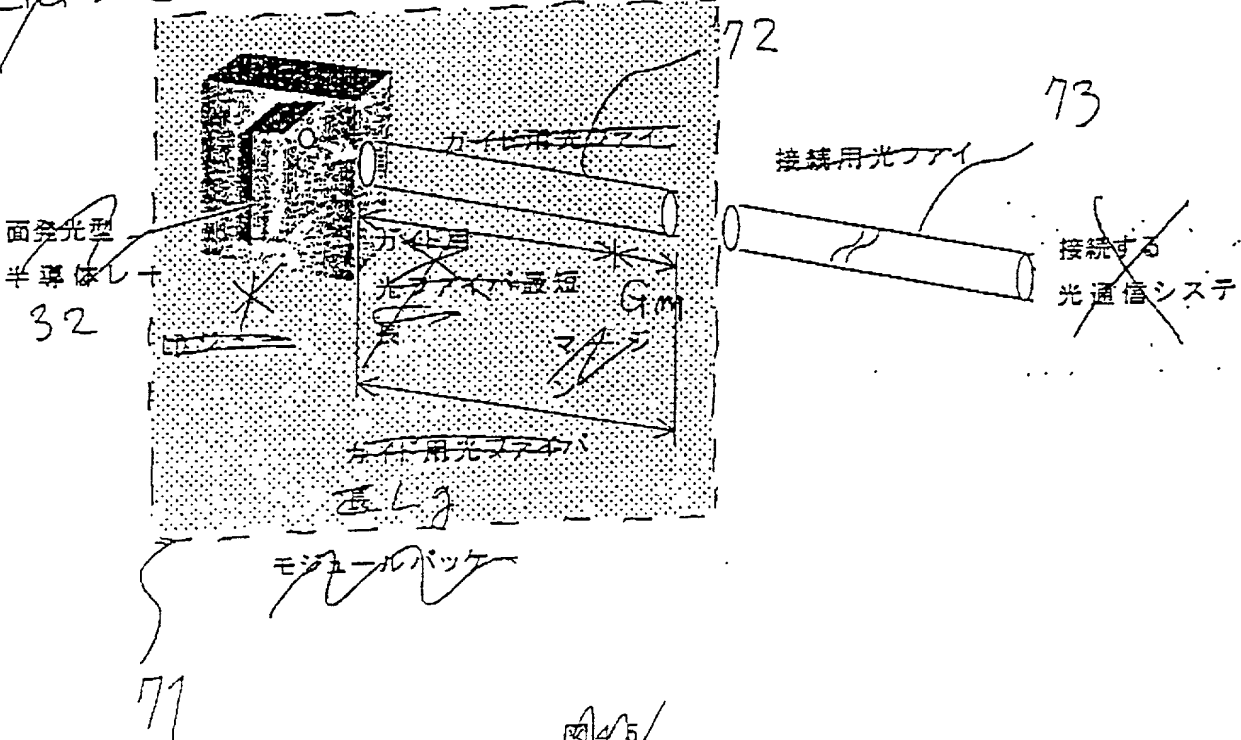
F/G61

89



~~FIG 62~~

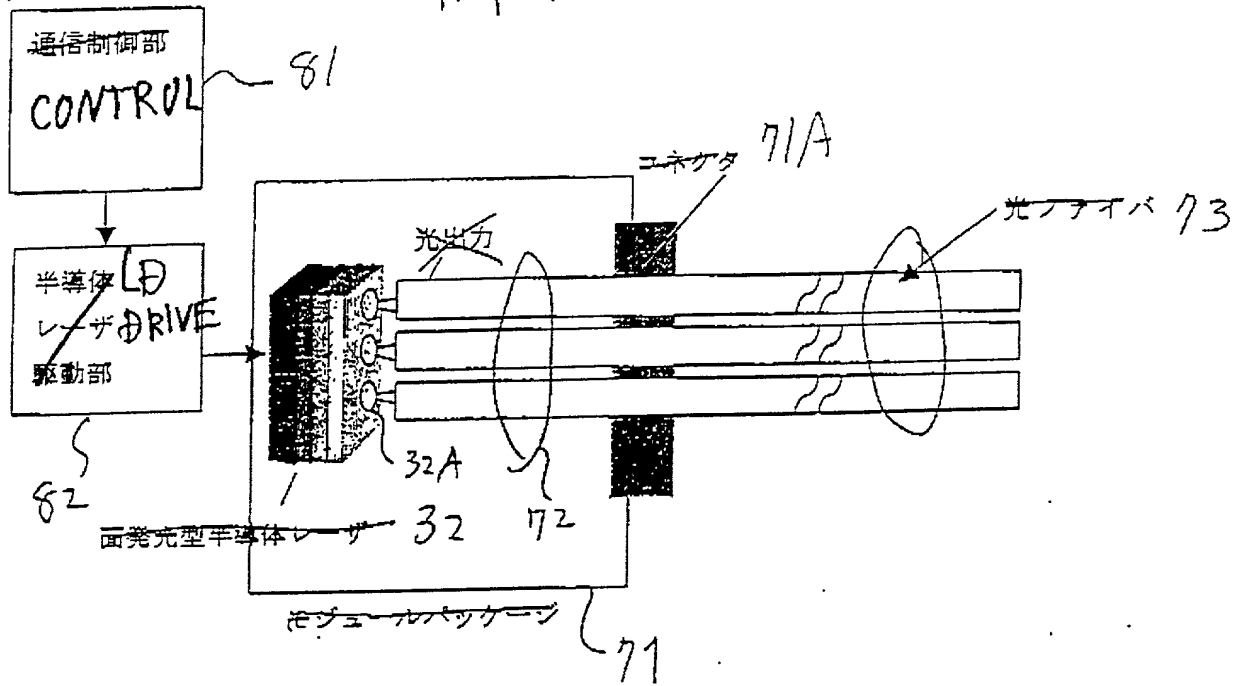
F/G62



710

[12] ~~63~~

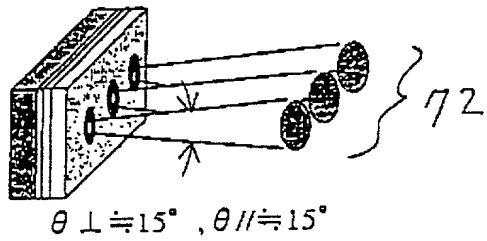
F1G63



46

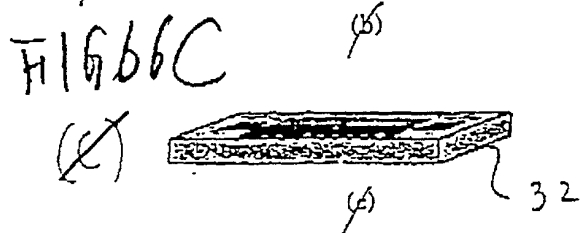
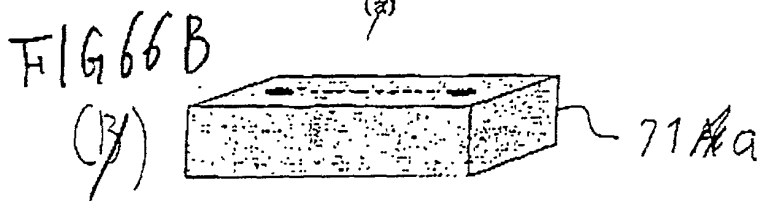
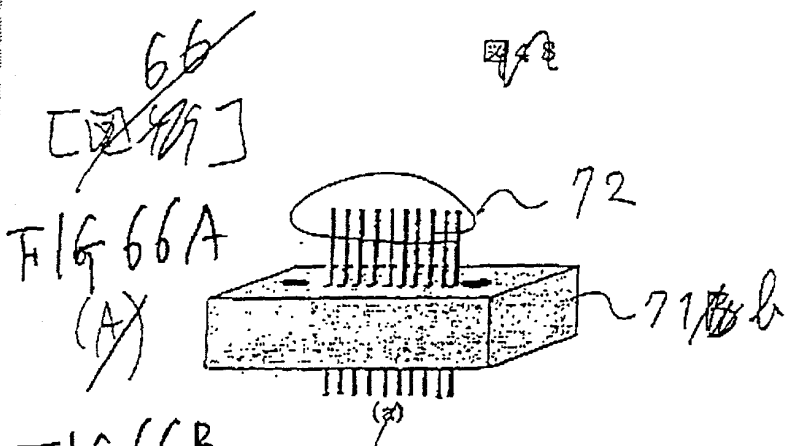
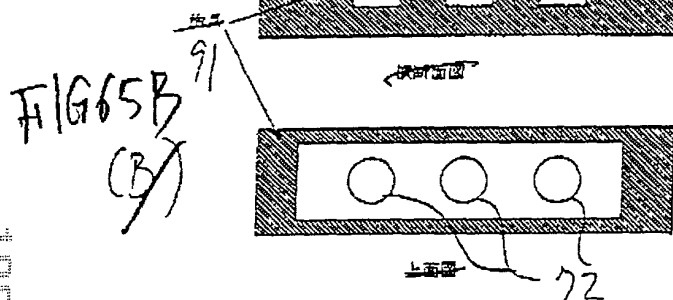
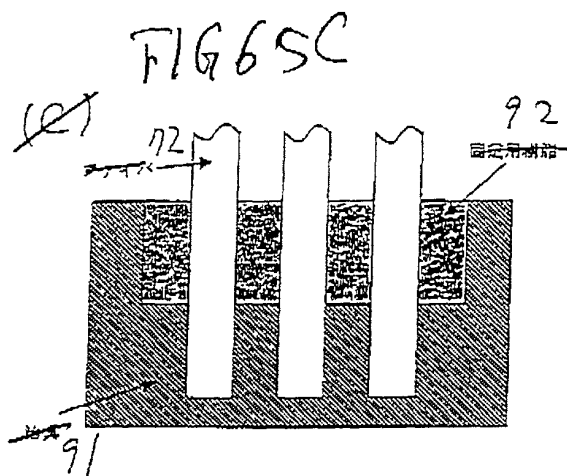
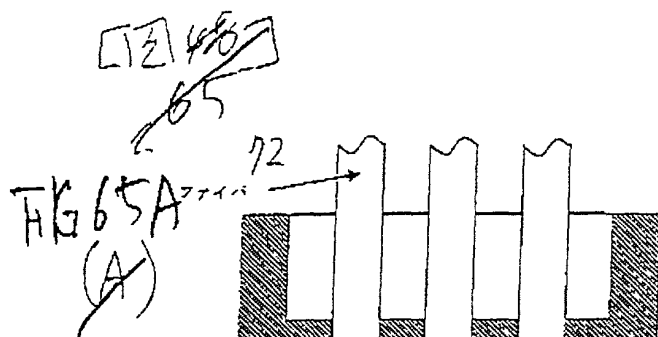
[12] ~~64~~

F1G64



47

FIG 10



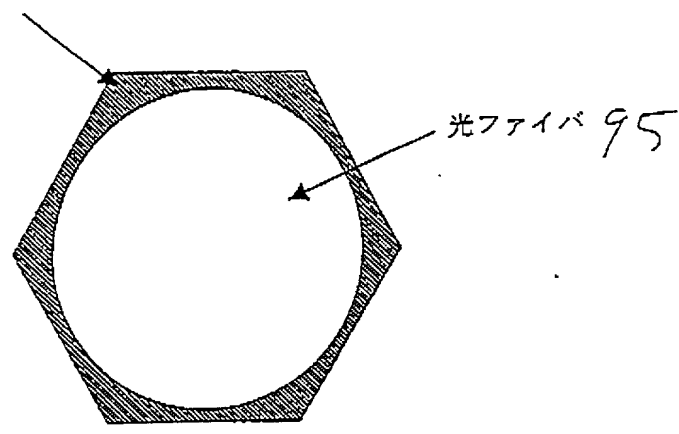
209220 40258001

710

~~61~~
~~[2/50]~~

H1667

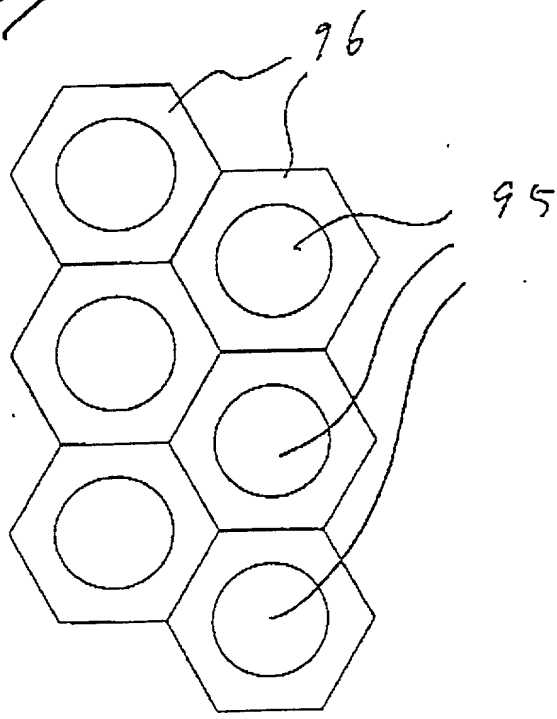
樹脂 ~~埋まる領域~~ 96



~~68~~
~~[2/50]~~

~~50~~

H1668



~~51~~

10055704 00000000

第11

69
 [12/82]

F/G 69

101

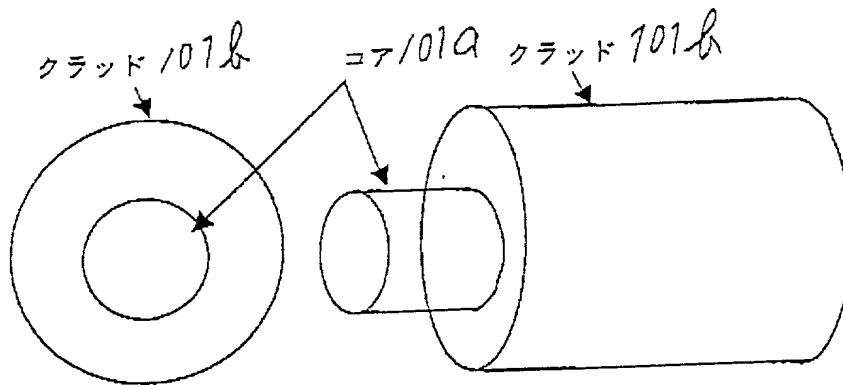


図 5/2

70
 [12/83]

F/G 70

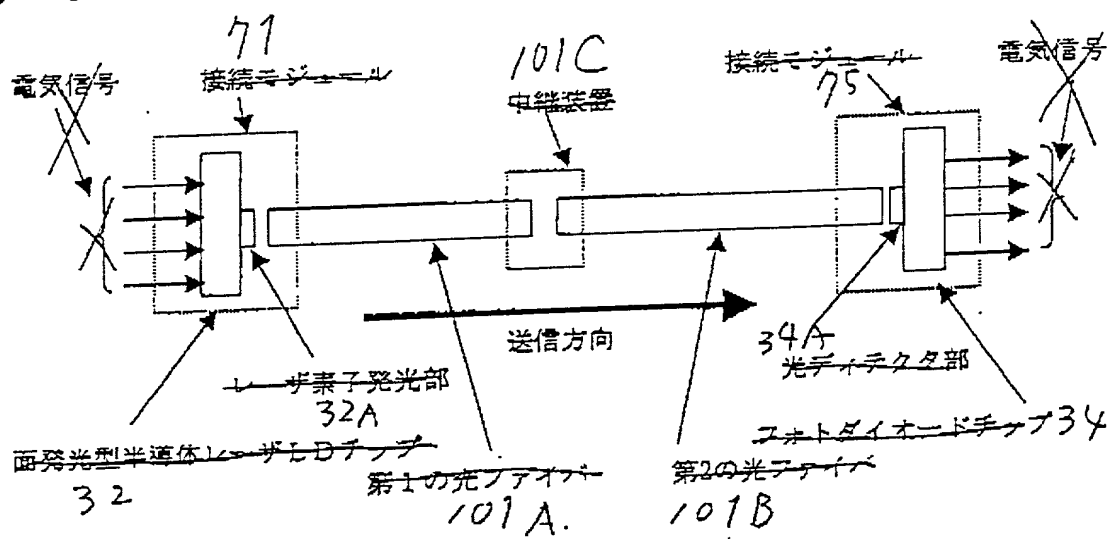


図 5/3

209220 40258001

1111

FIG 71

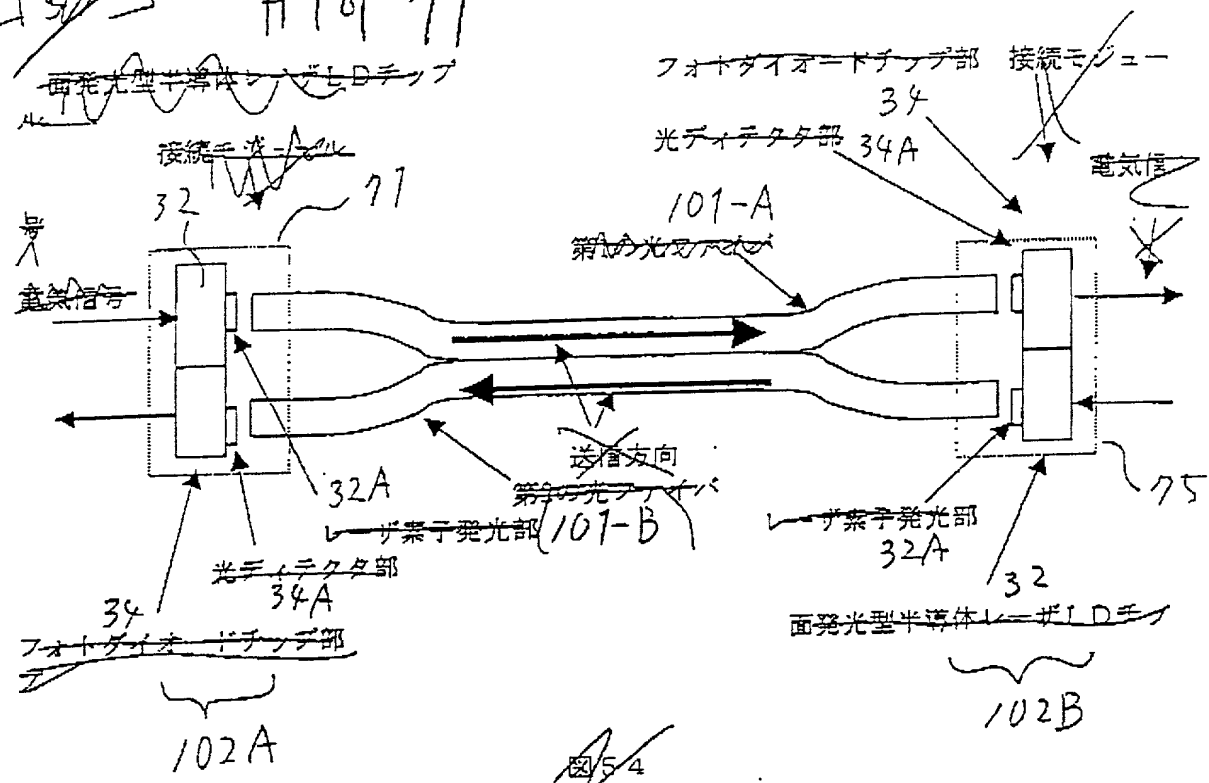


図 54

FIG 72

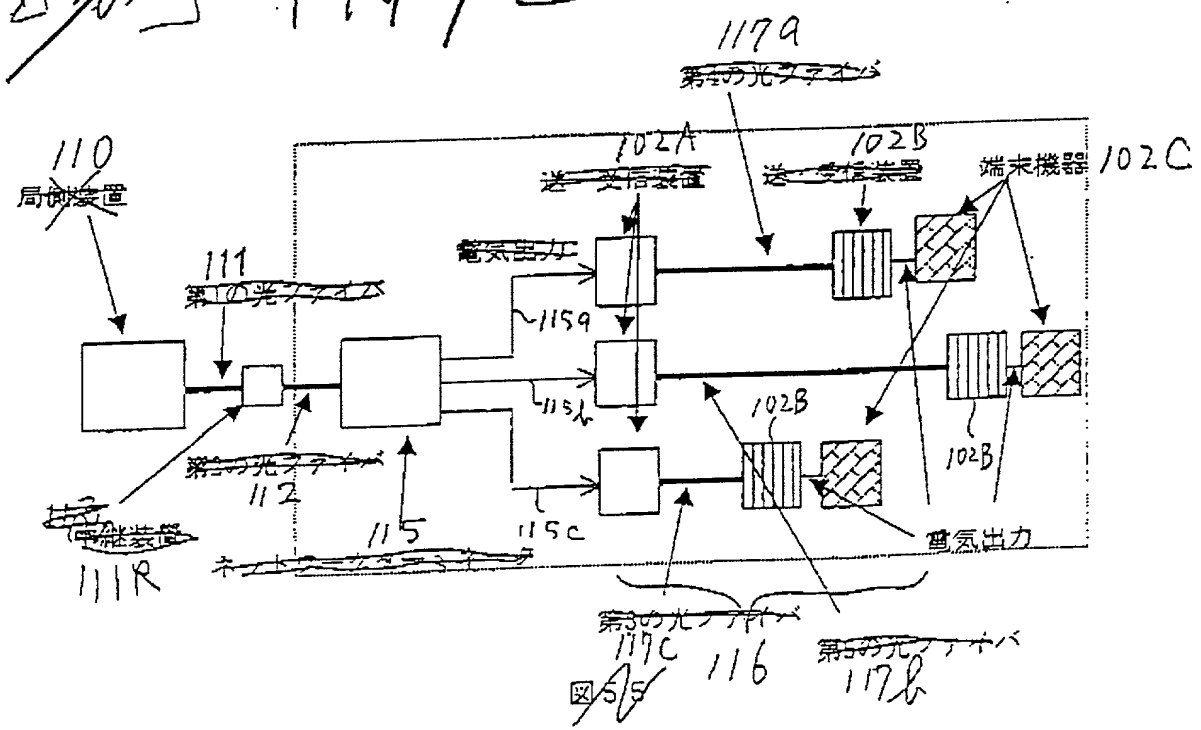
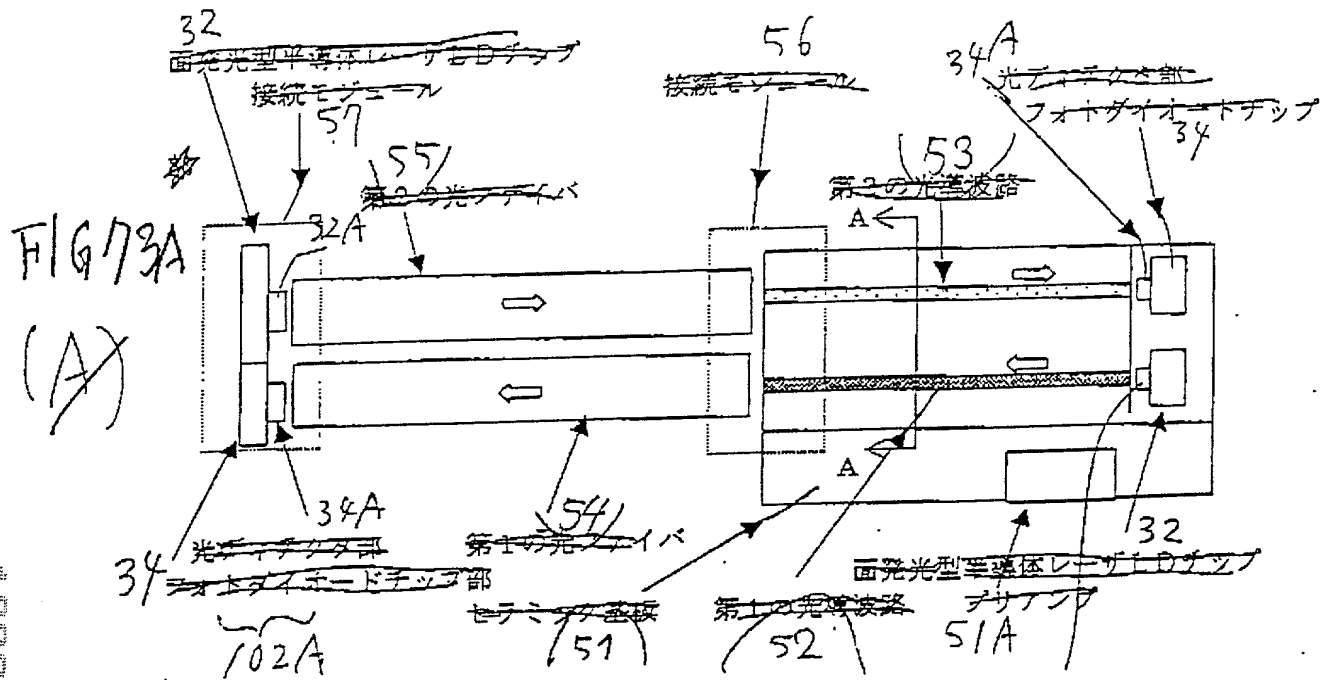


図 55

1005204 022502

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FIG 73A



209220 40258001 10032004 022602

FIG 73B

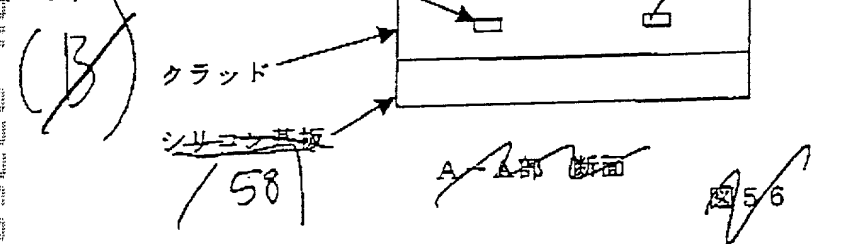
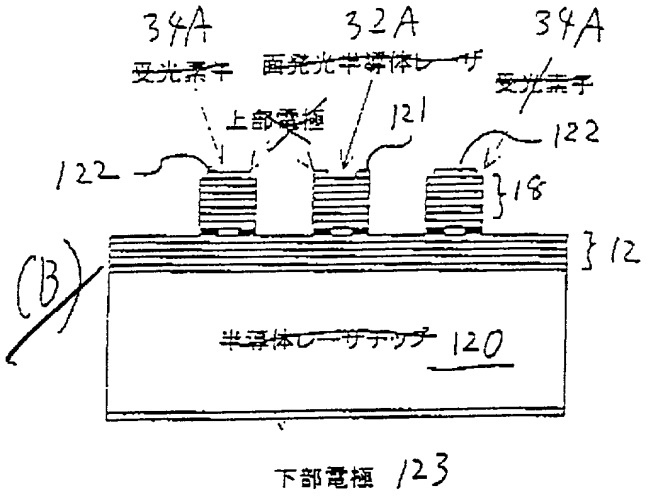
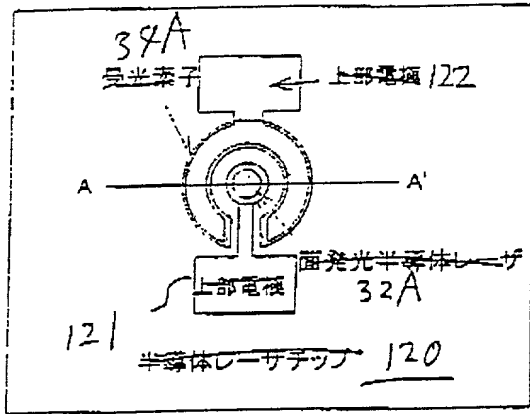


図 56

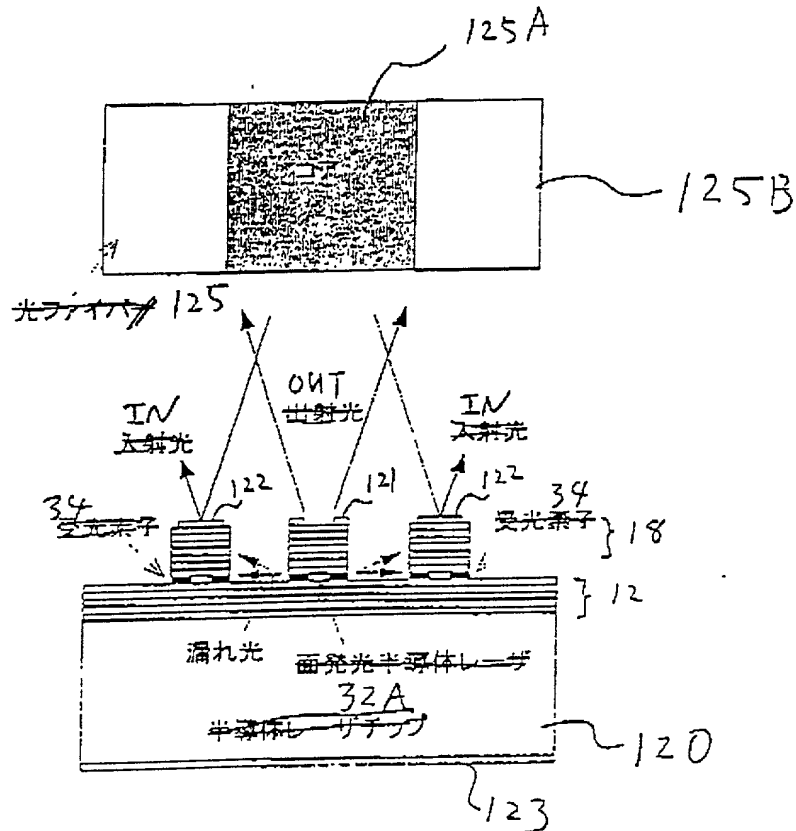
~~FIG 74A~~

FIG 74B 12



209220 40258001

~~FIG 75~~



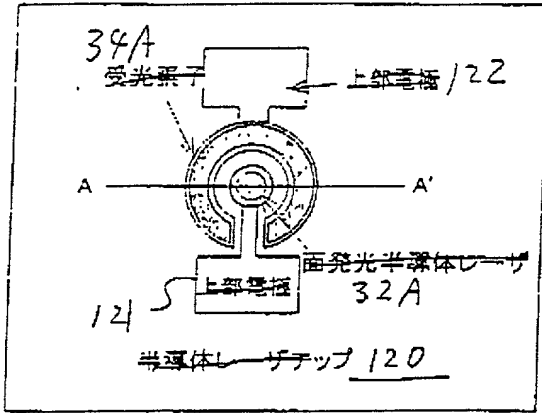
~~FIG 76A~~

FIG 76A

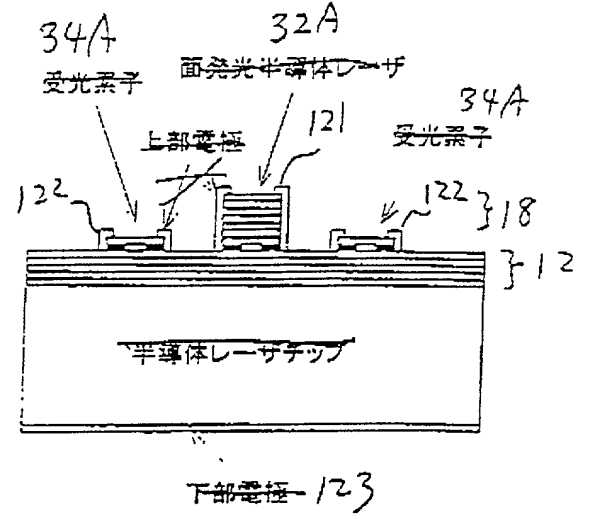
FIG 76B

FIG 12

(A)



(B)



(a)

図 59

(b)

~~FIG 77~~

FIG 77

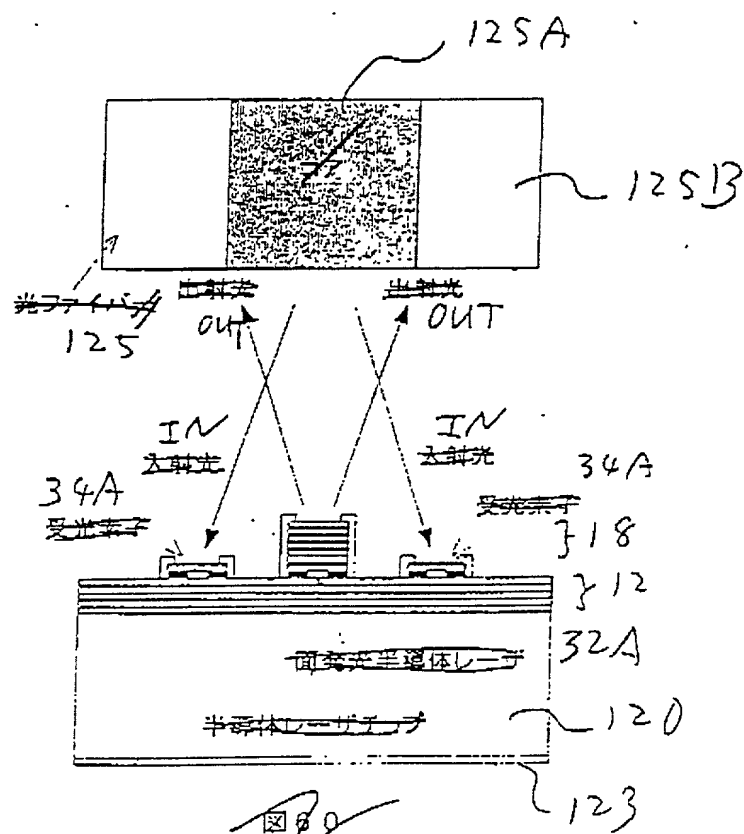


図 60

209220 40258001

13

~~[FIG 78]~~
78

FIG 78

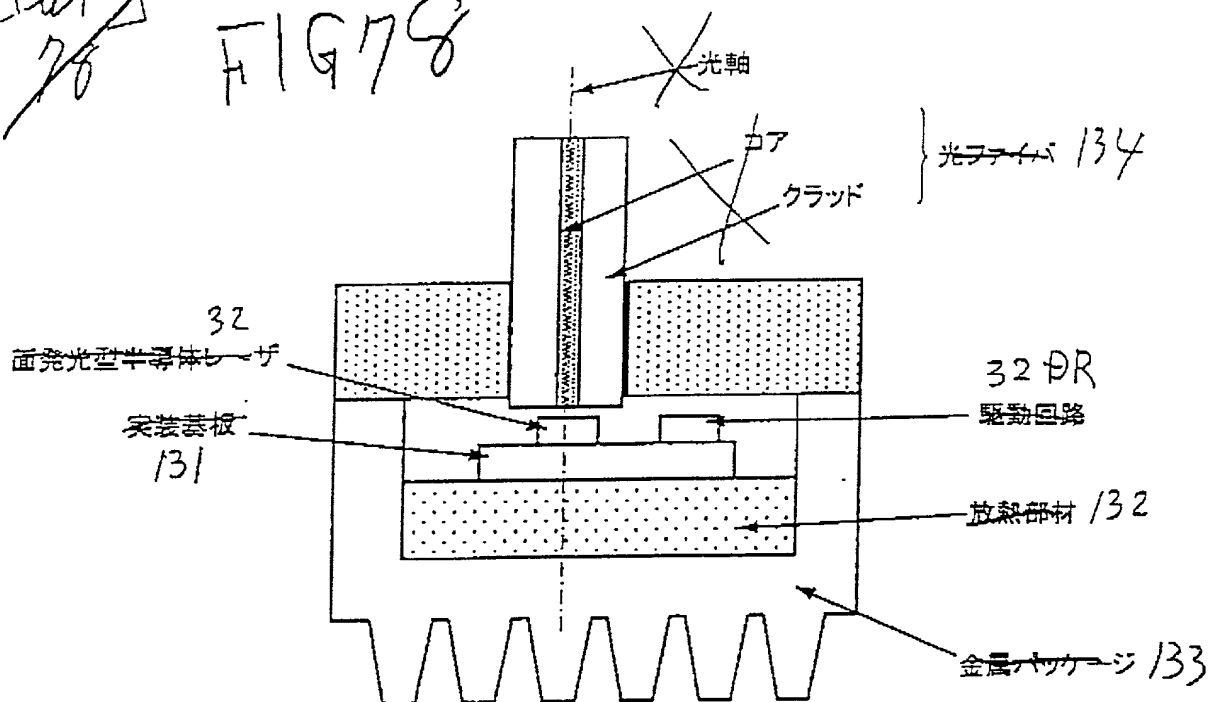


図 6.1

~~[FIG 79]~~
79

FIG 79

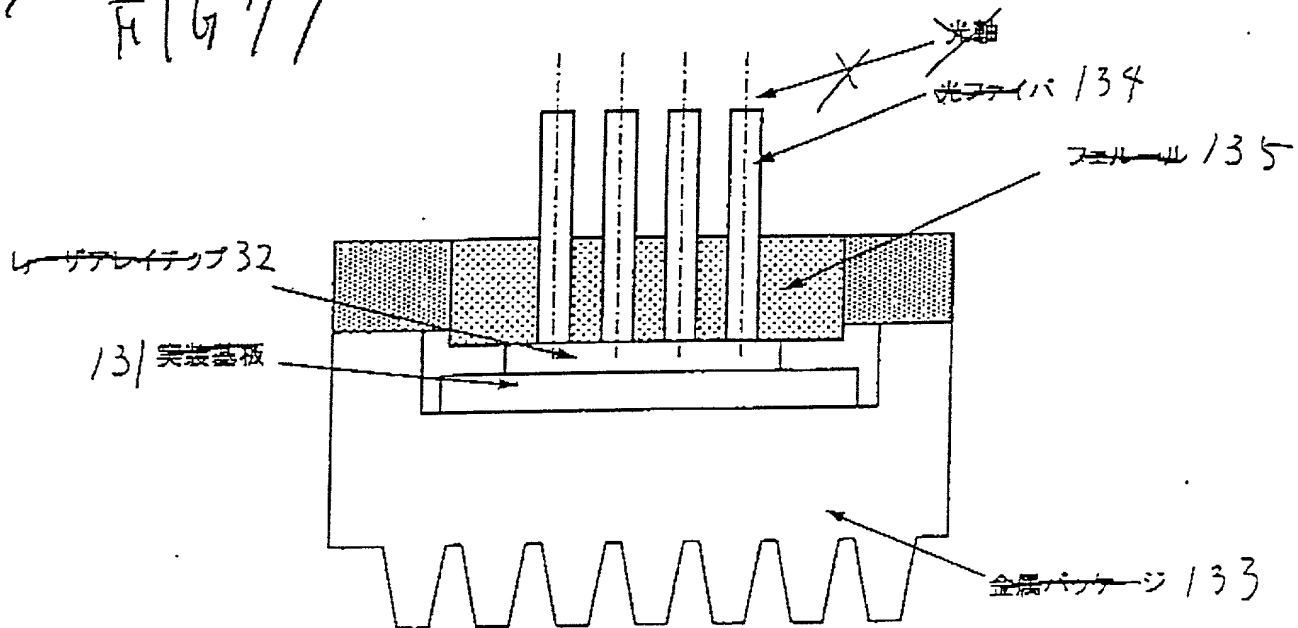


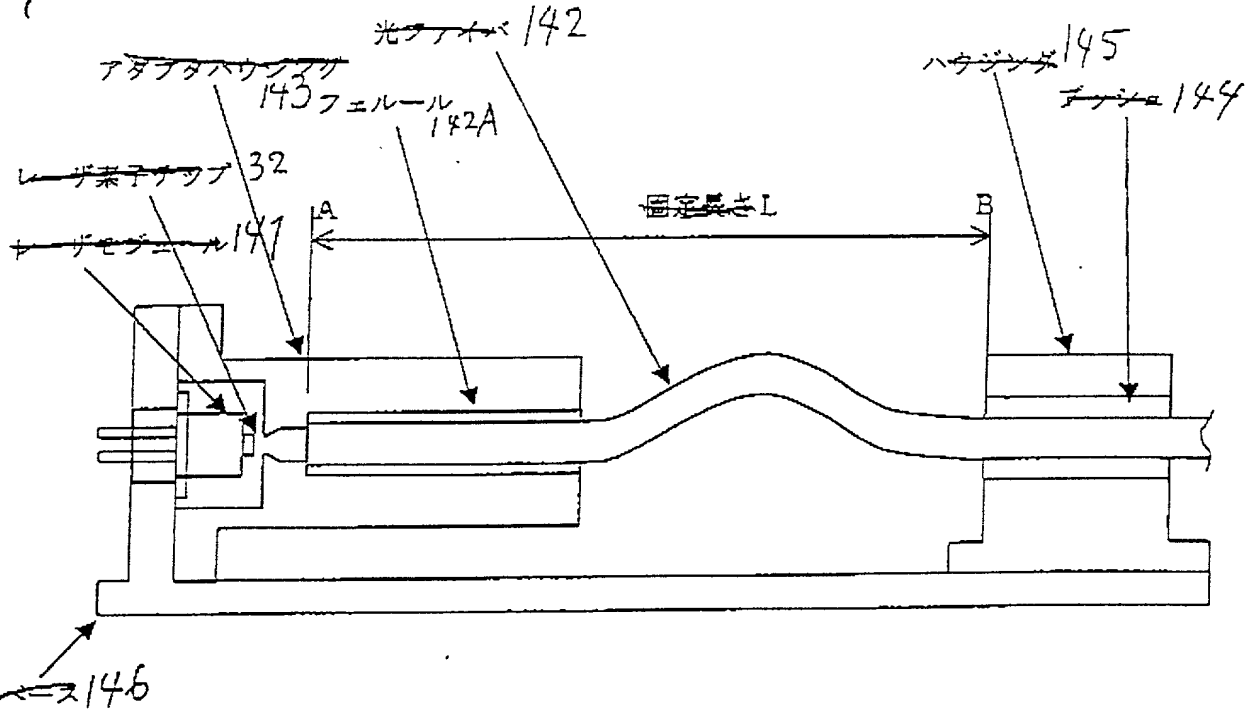
図 6.2

10085204.022602

[図 60]
80

FIG 80

414



200220 40258007

[図 61]
81

FIG 81

図 63

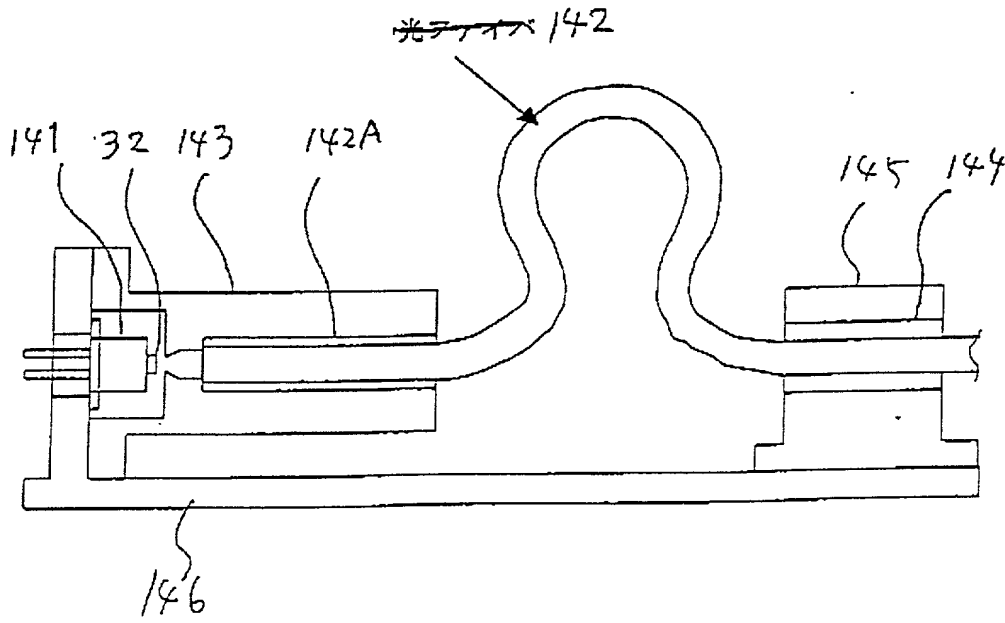
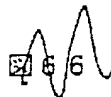
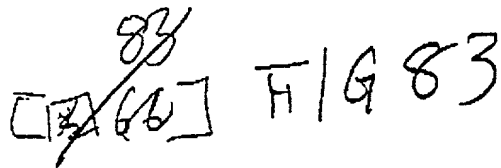


図 64

F/G 82

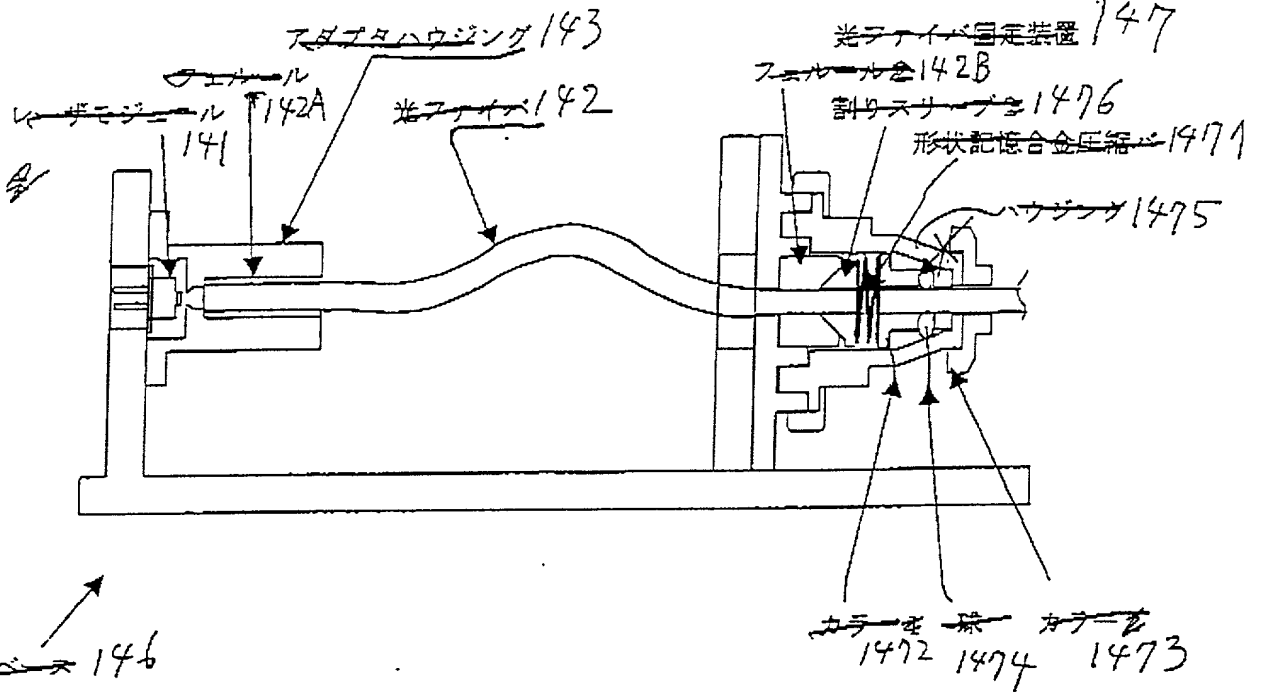
717



84
~~FIG 84~~

FIG 84

714



85
~~FIG 85~~

FIG 85

FIG 61

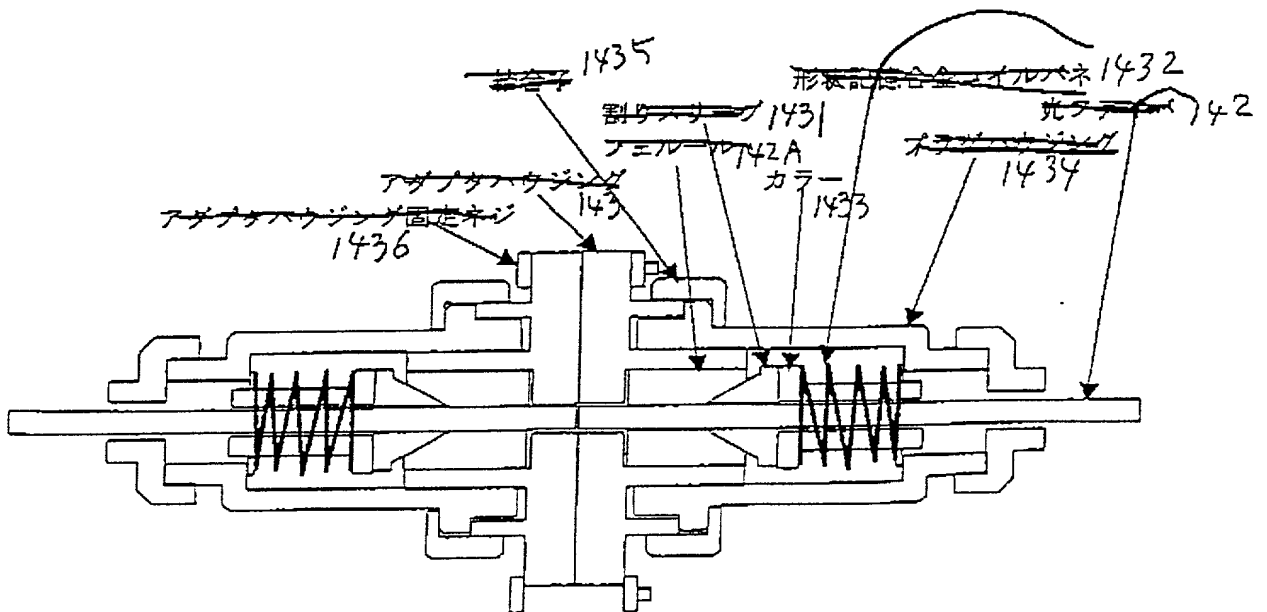
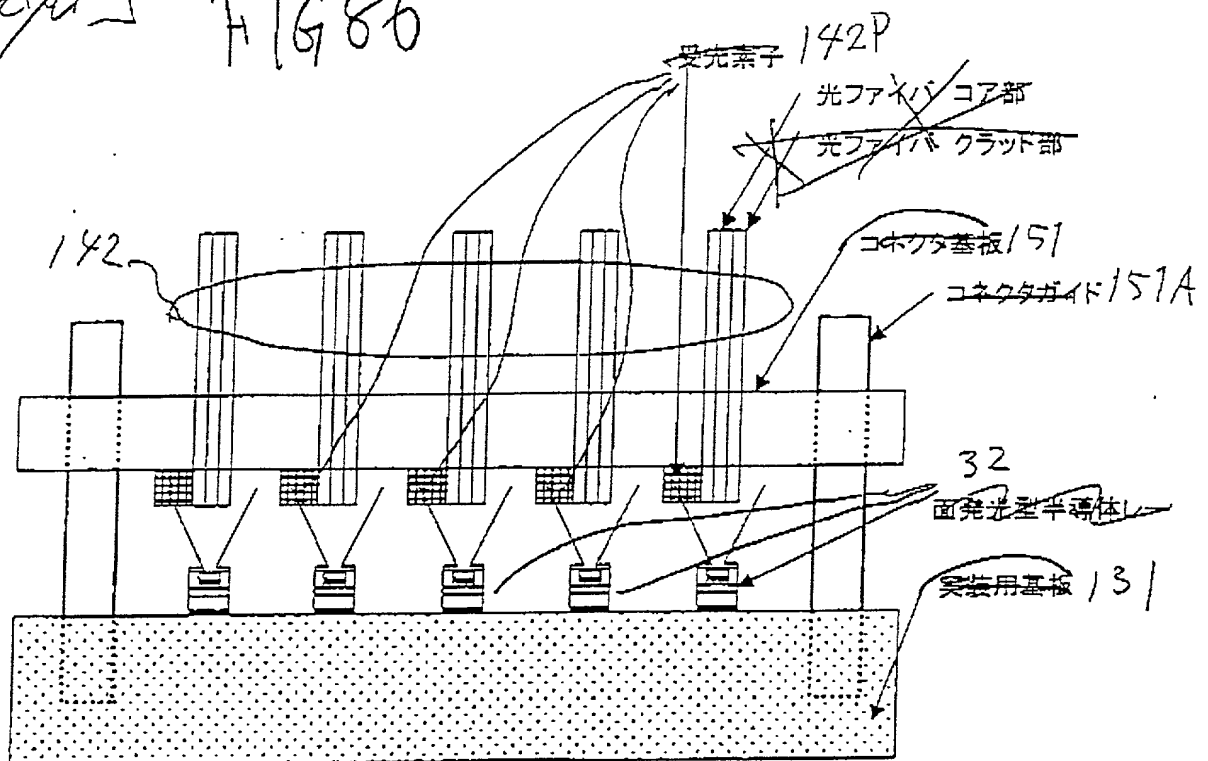


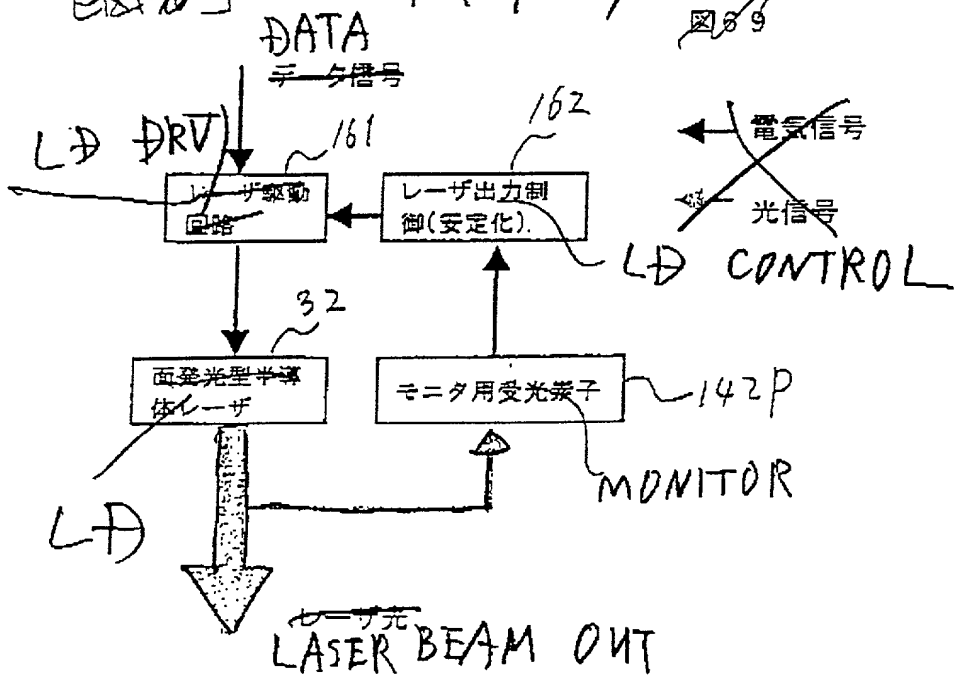
FIG 68

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86
~~FIG 86~~ FIG 86



87
~~FIG 87~~ FIG 87



光出力部のブロックダイアグラム

FIG 10

2009220 4025800T

13

FIG 88

FIG 88

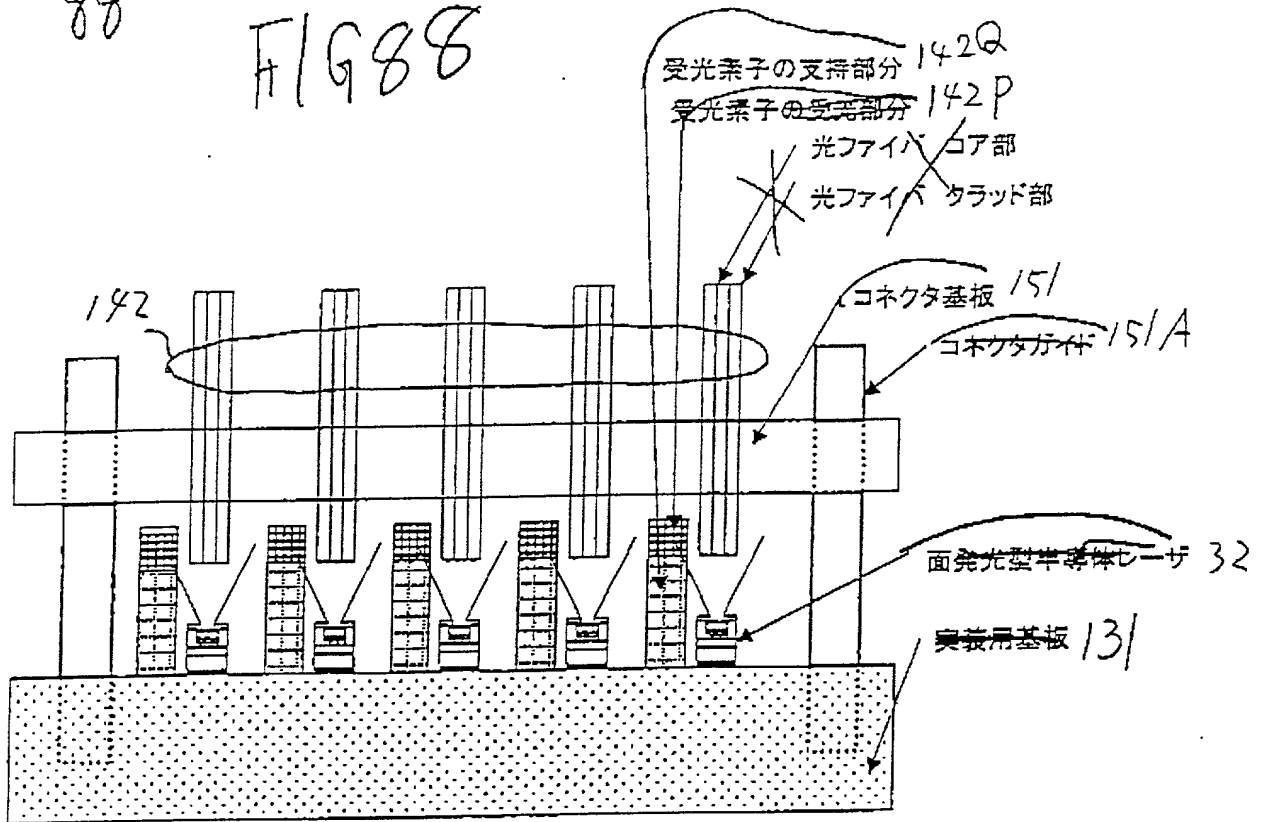


FIG 89

FIG 89

図 72

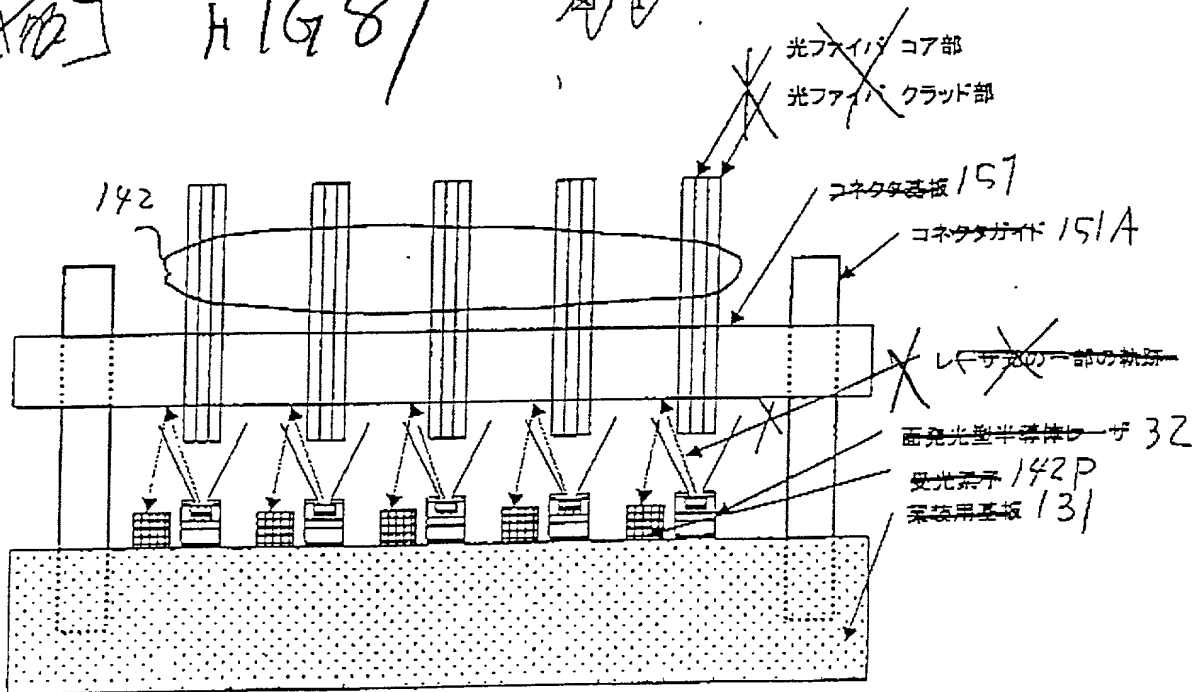


図 72

[12] 98
90

F/G90

7/15

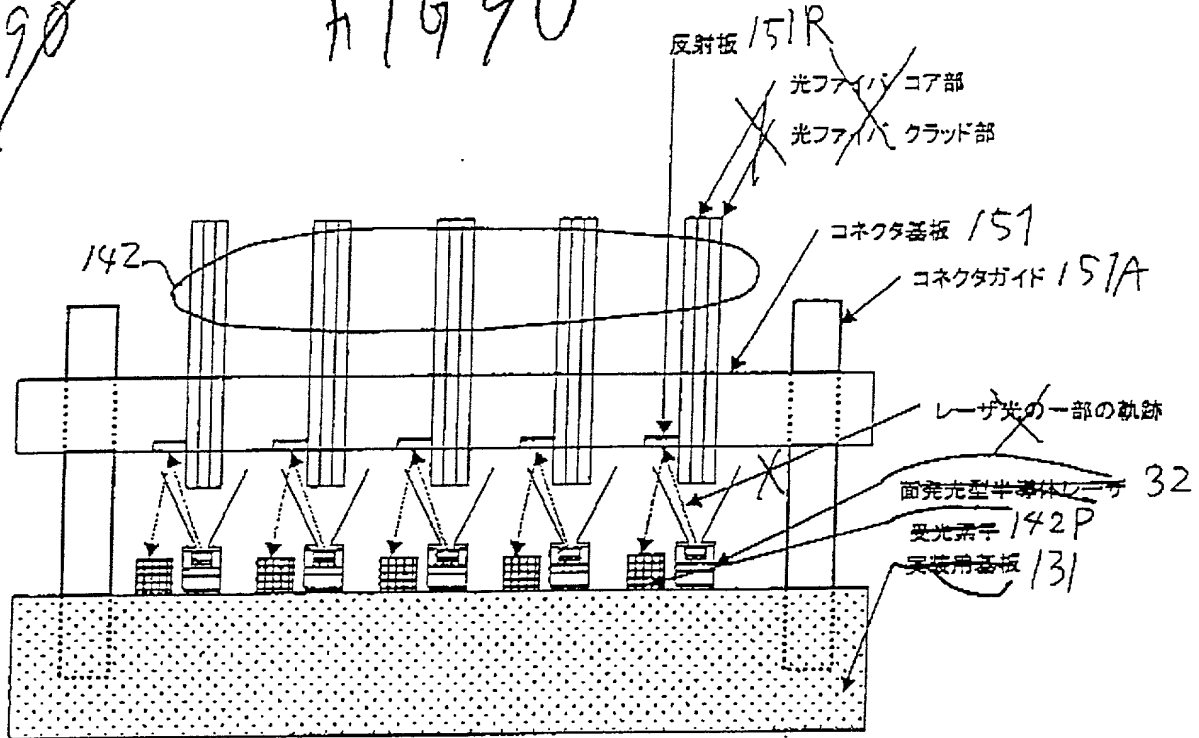
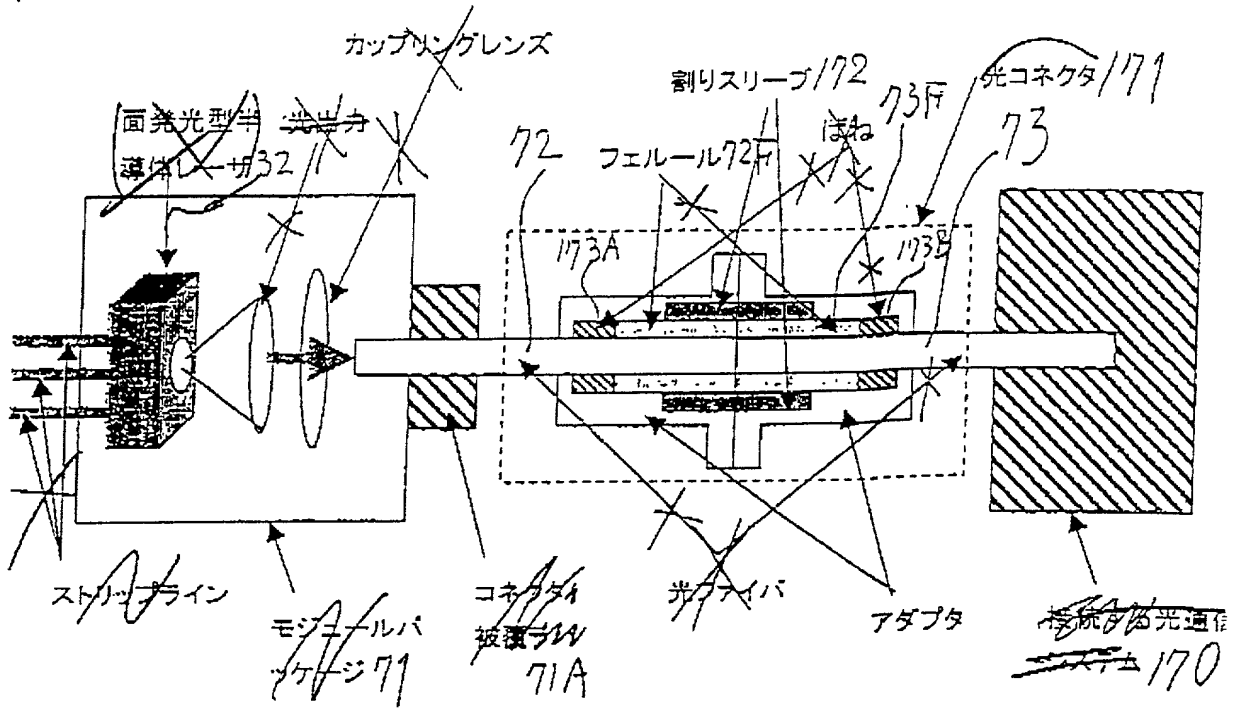


図 73

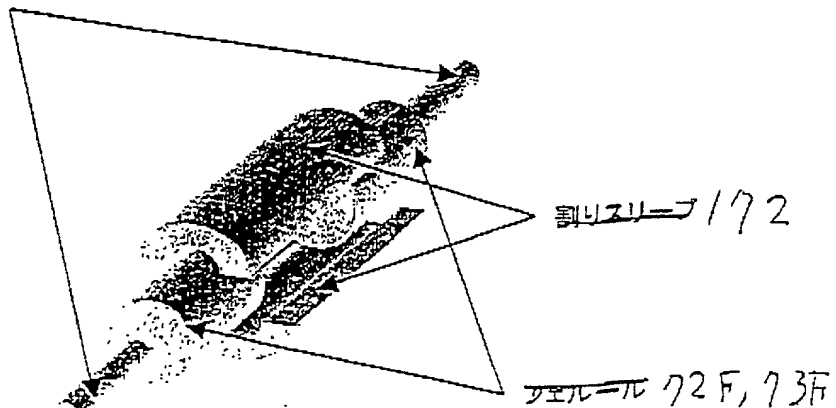
16

~~FIG 91~~ ~~91~~ FIG 91



~~FIG 92~~ ~~92~~ FIG 92

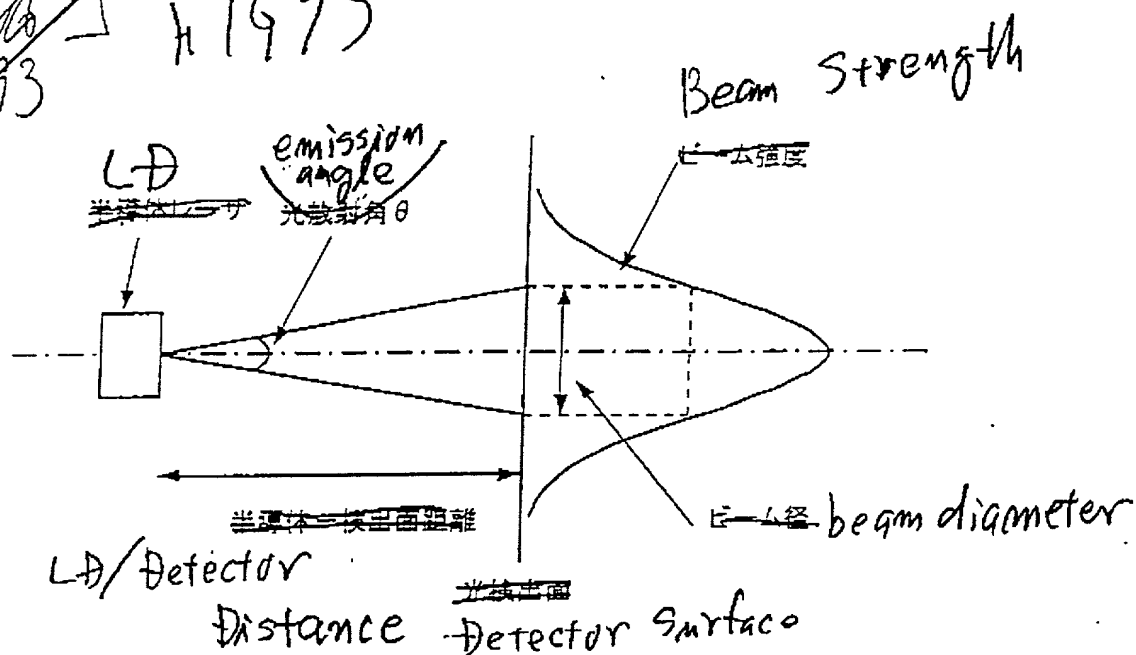
光ファイバ 72, 73



~~FIG 92~~

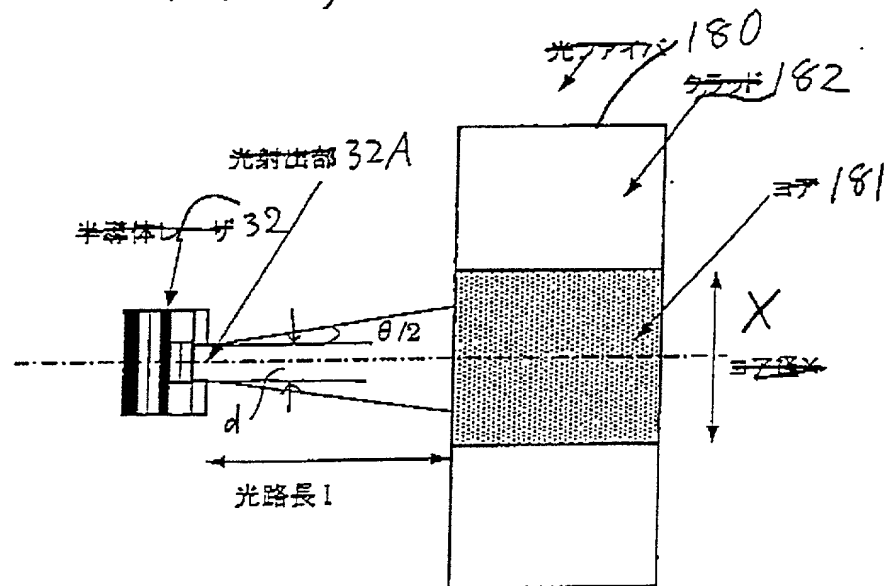
~~FIG 93~~ FIG 93

17



~~FIG 94~~ FIG 94

16



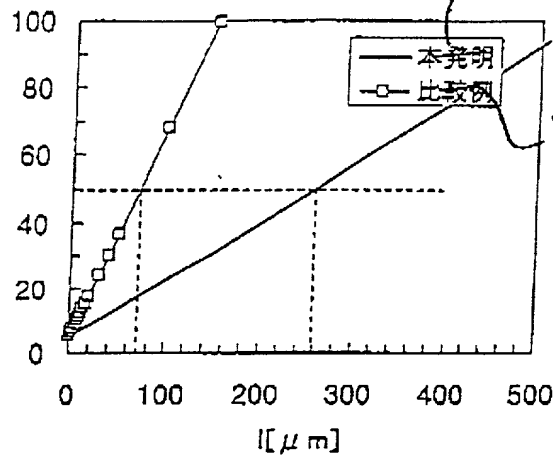
16

[~~FIG 95~~]
 95

FIG 95

Beam Diameter

ビーム径[μm]



Present Invention

Reference

[~~FIG 96~~]
 96

FIG 96

図 7a

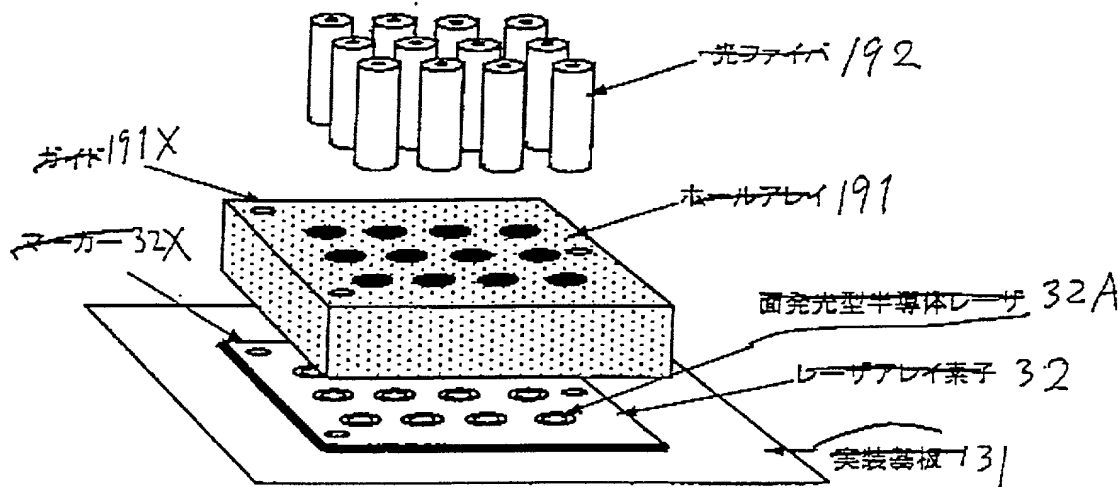


図 7a

~~FIG 97~~
 97

~~FIG 19~~

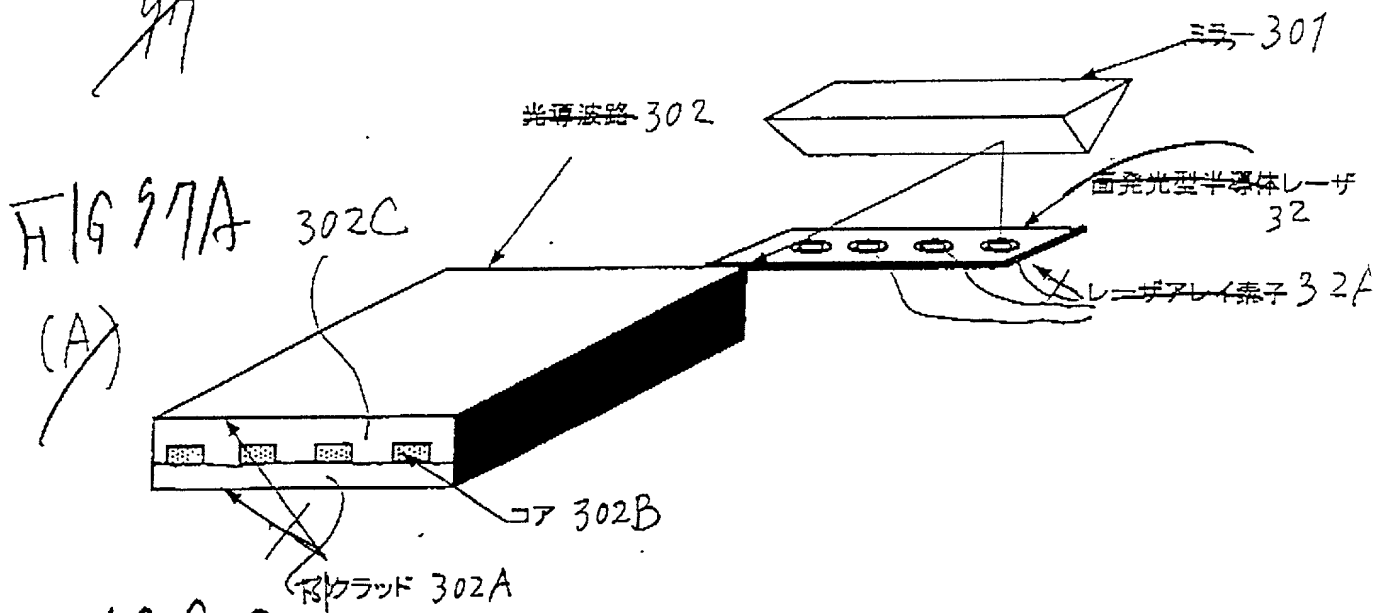
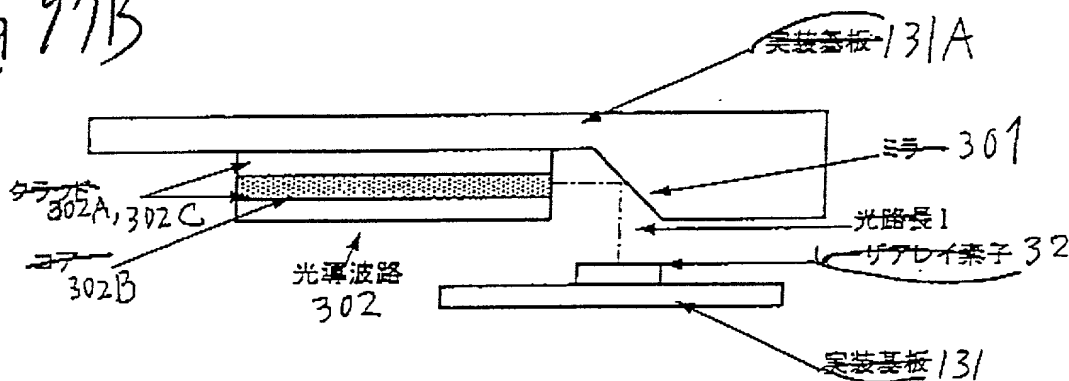
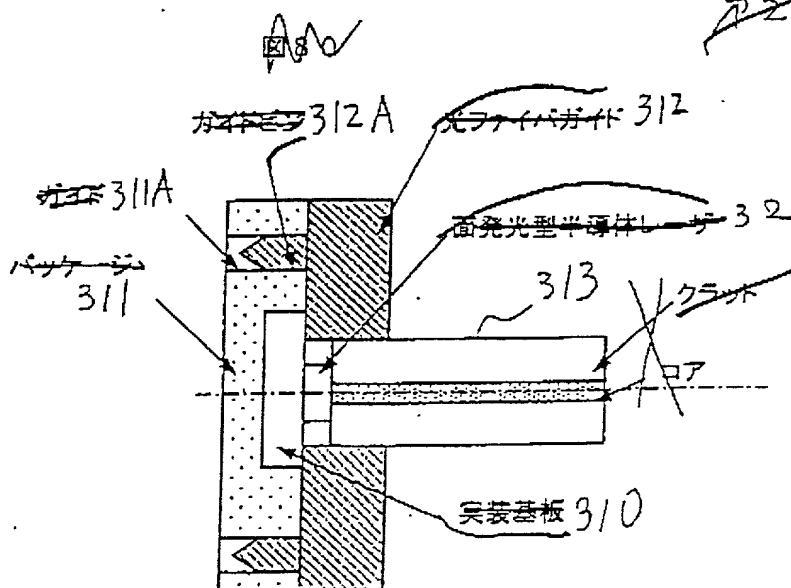


FIG 97B (B)



~~FIG 98~~
 98

~~FIG 20~~

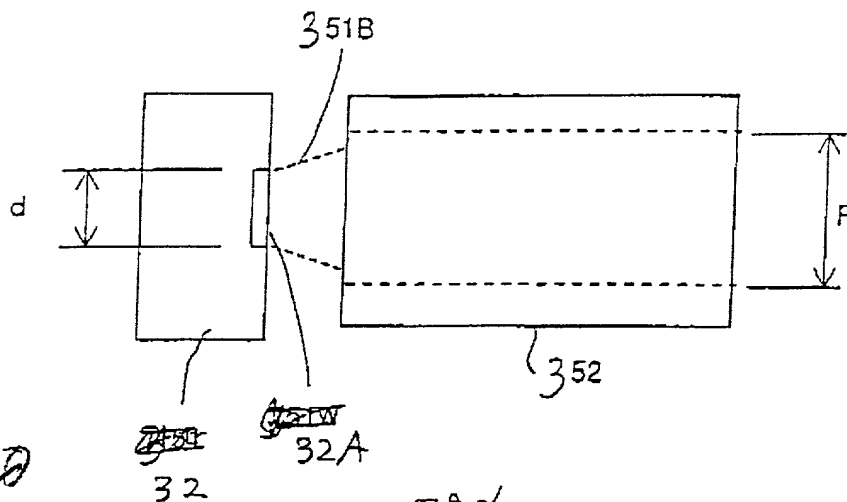


51

47
~~[12/92]~~

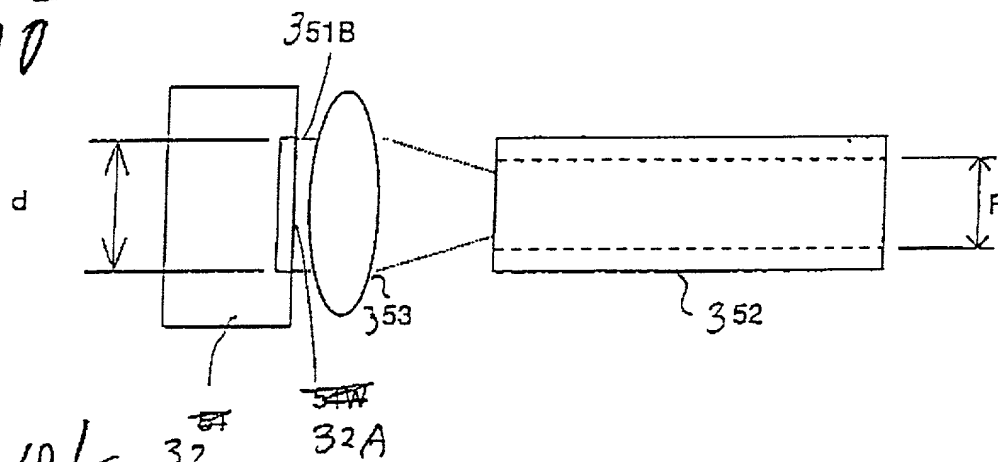
82/

F/G 99



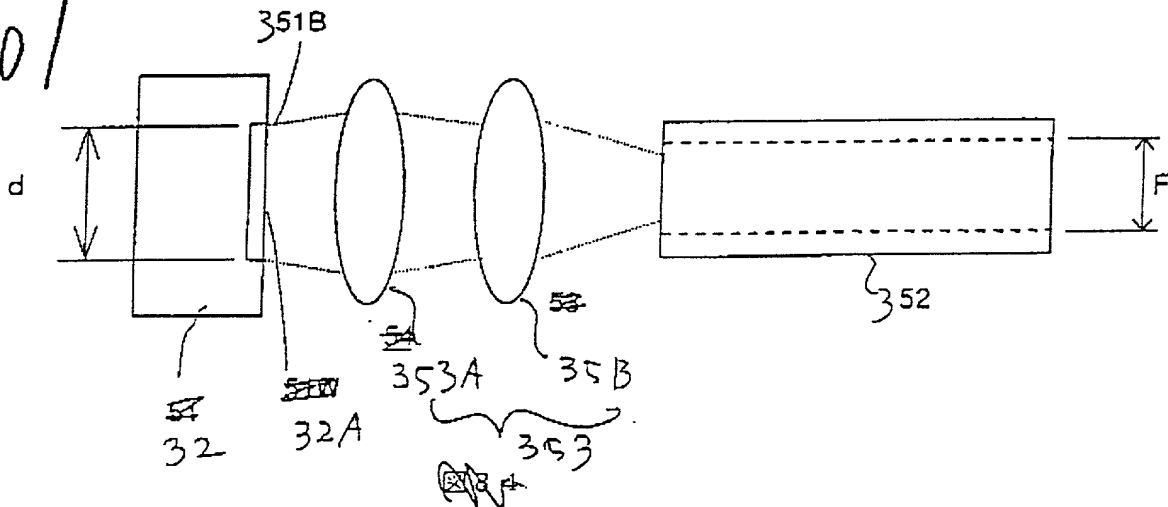
100
~~[12/98]~~

F/G 100



101
~~[12/98]~~

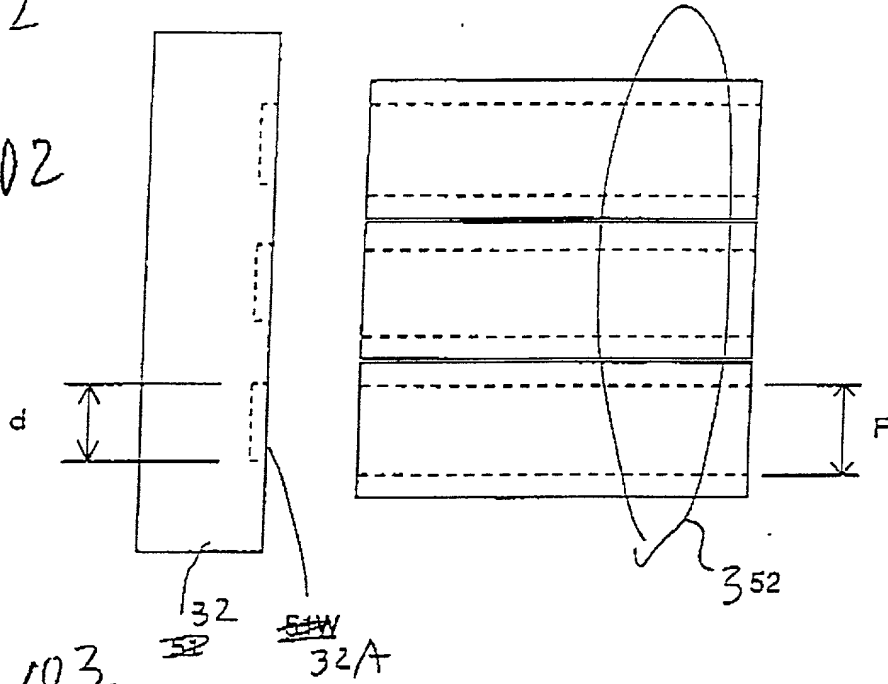
F/G 101



[12] ~~88~~
102

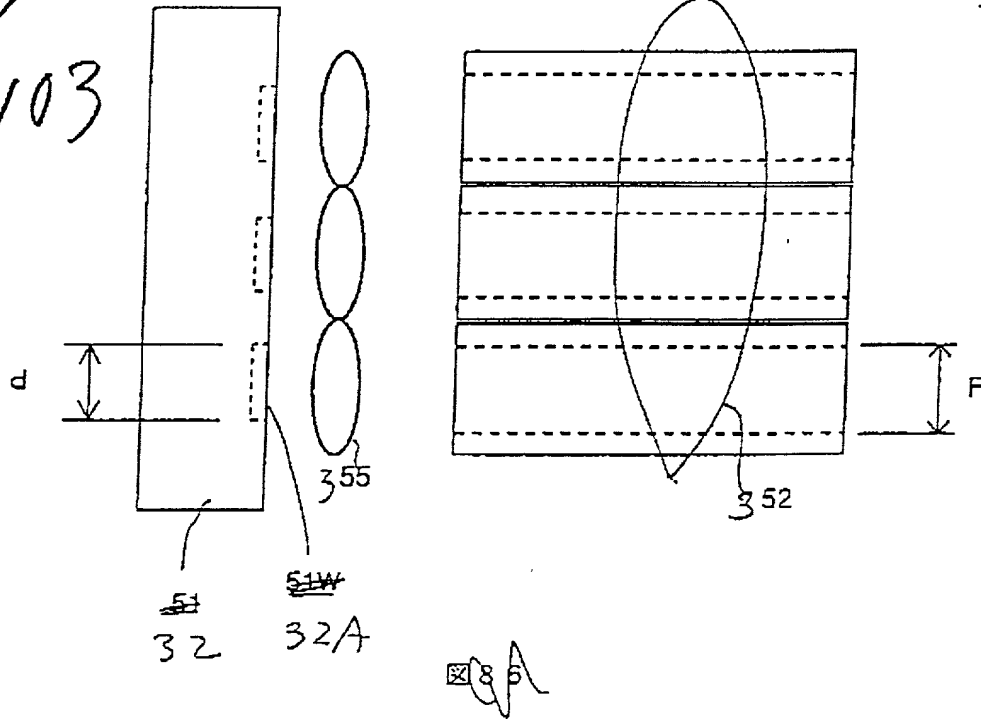
512/

FIG 102



103
[12] ~~88~~

FIG 103



209220 40258001

22

[2] 84
 104
 FIG 104A
 (A)

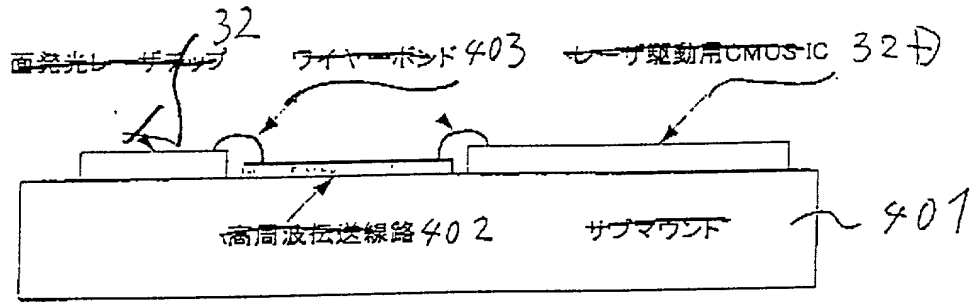
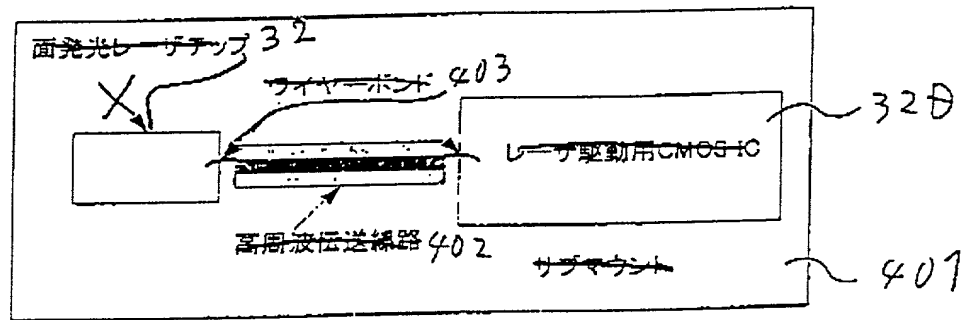


FIG 104B
 (B)



105
 [2] 88

(b)
 図 87

24

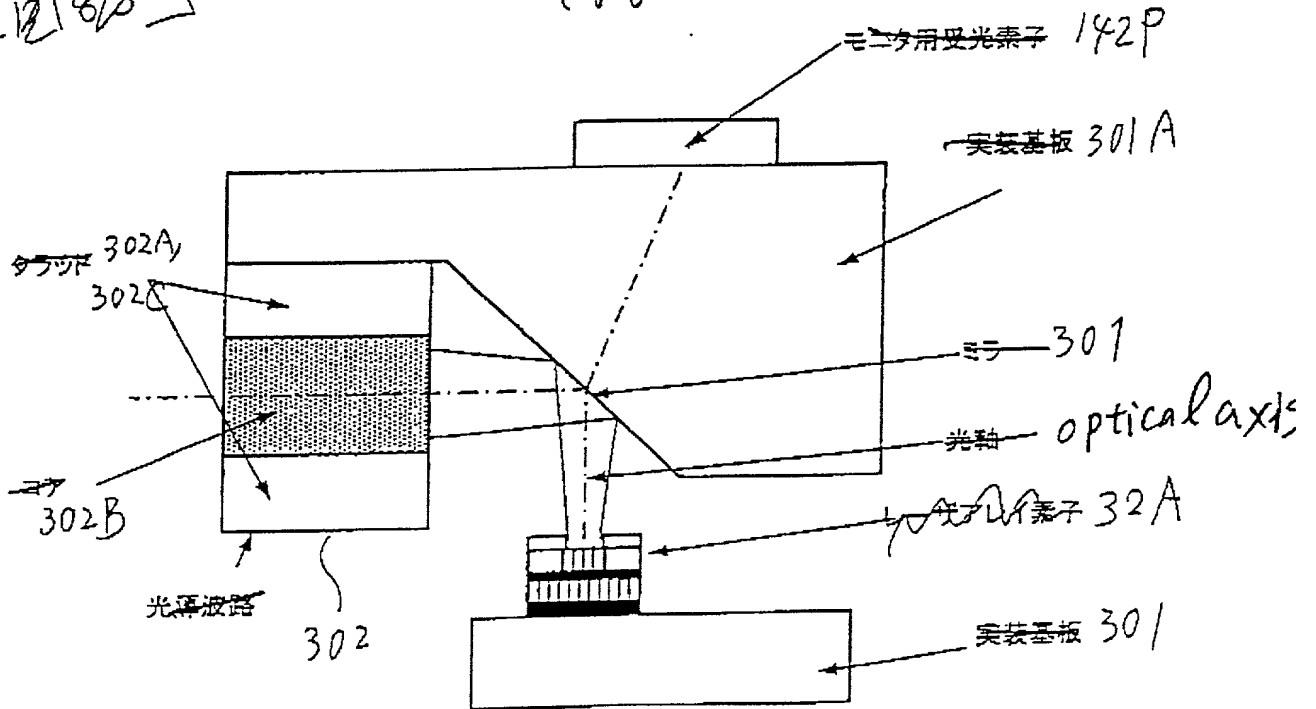
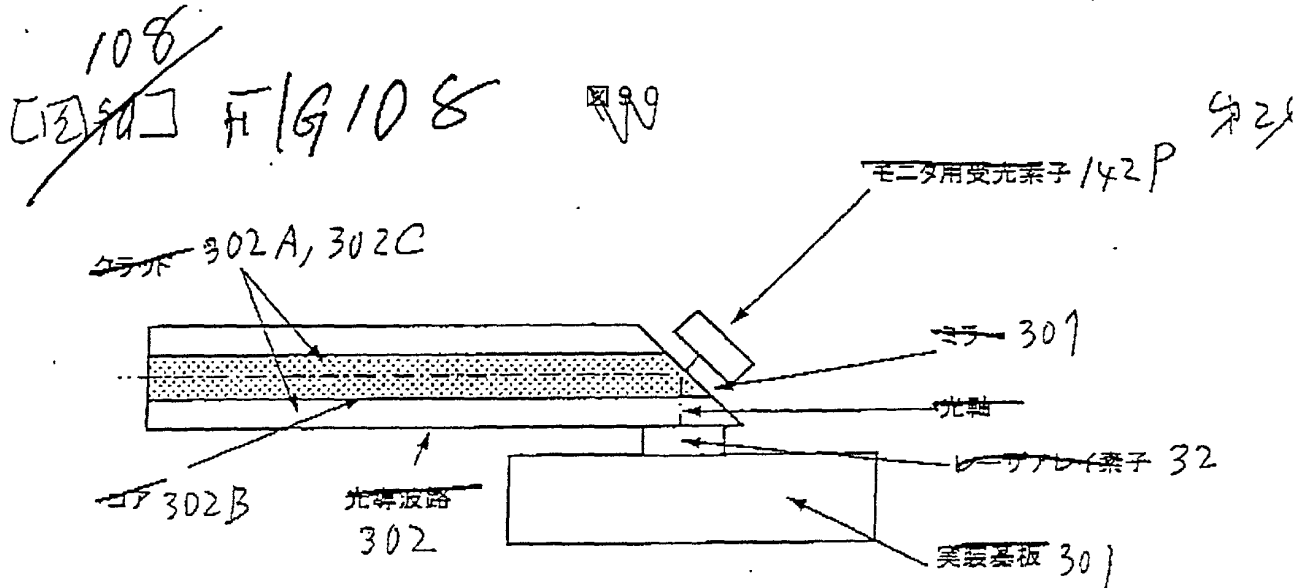
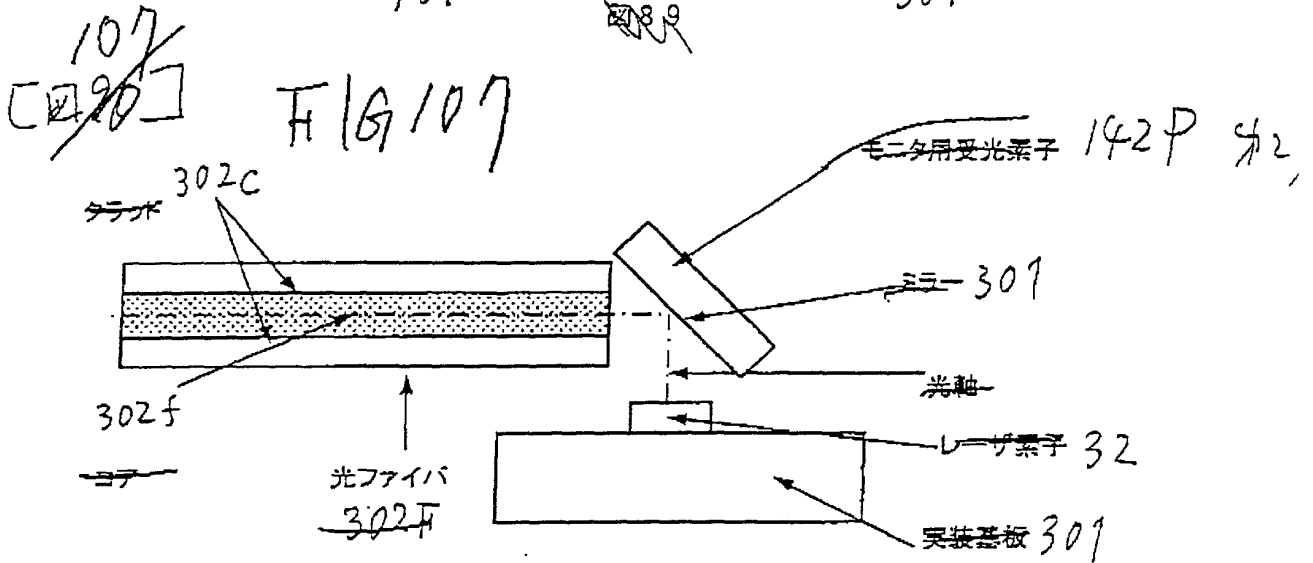
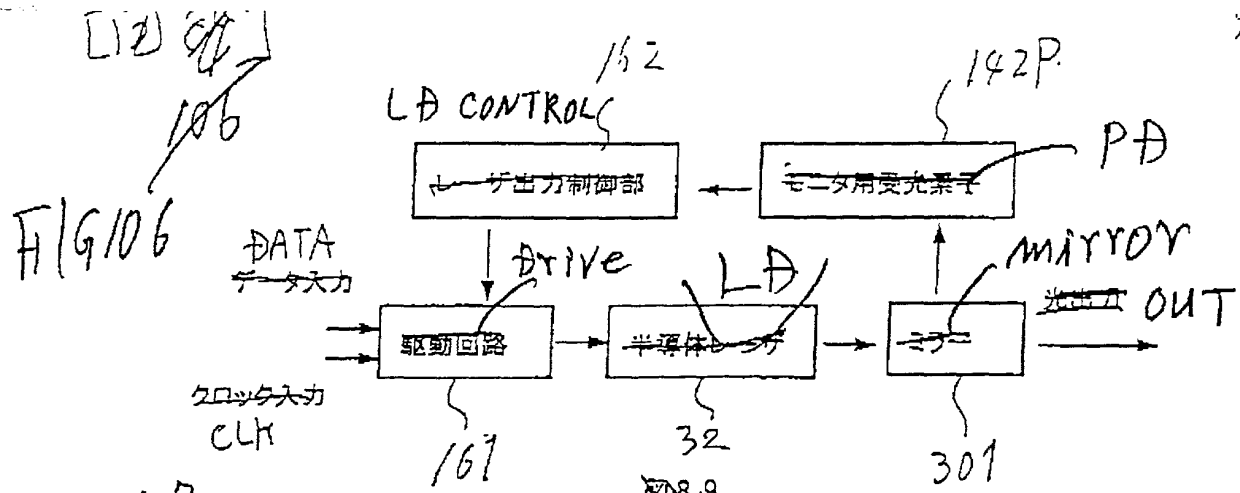


図 88

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2005204 4025801

925

[13] 92
109
FIG 109

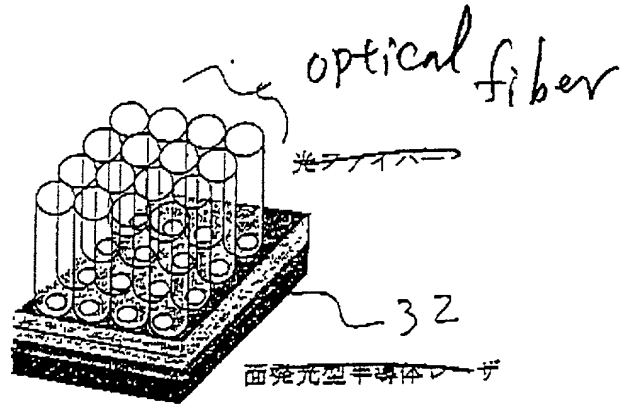


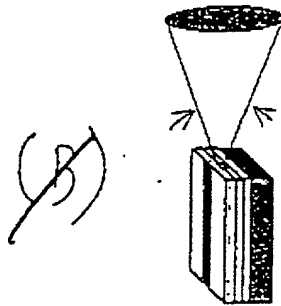
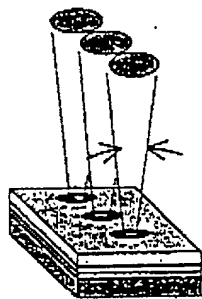
図 92

10055204.022603

110
[13] 92
FIG 110 A
(A)

FIG 110 B

925



(a) 面発光型半導体レーザ (b) 端面発光型半導体レーザ

図 93

[E] 94
 111

FIG 111A

(A)

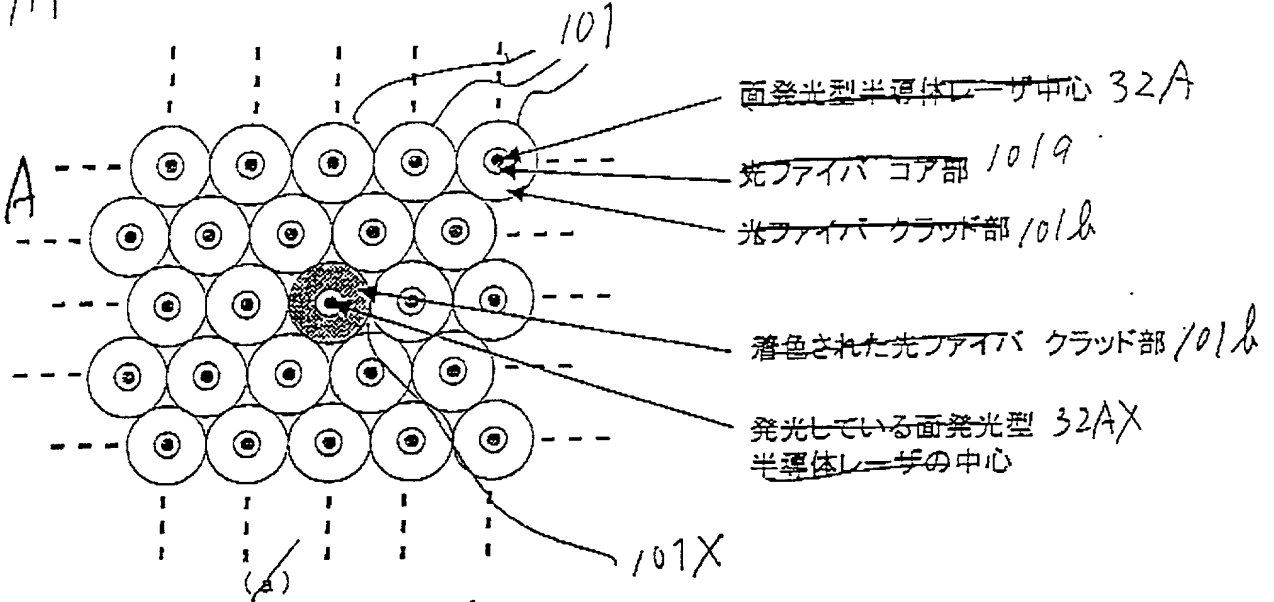


FIG 111B

(B)

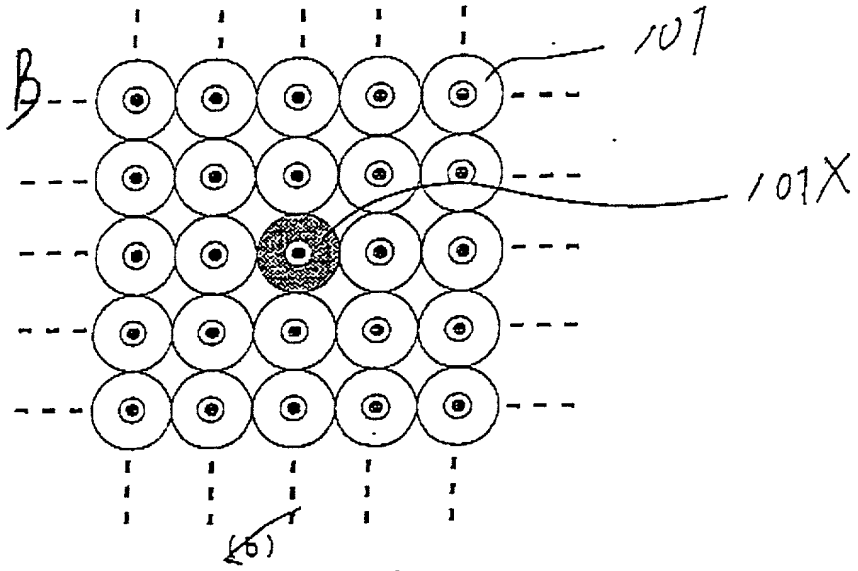


FIG 111C

(C)

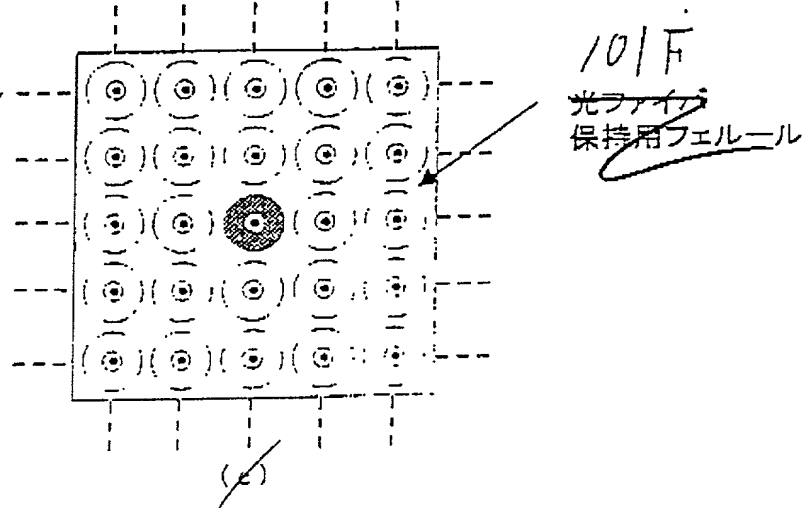
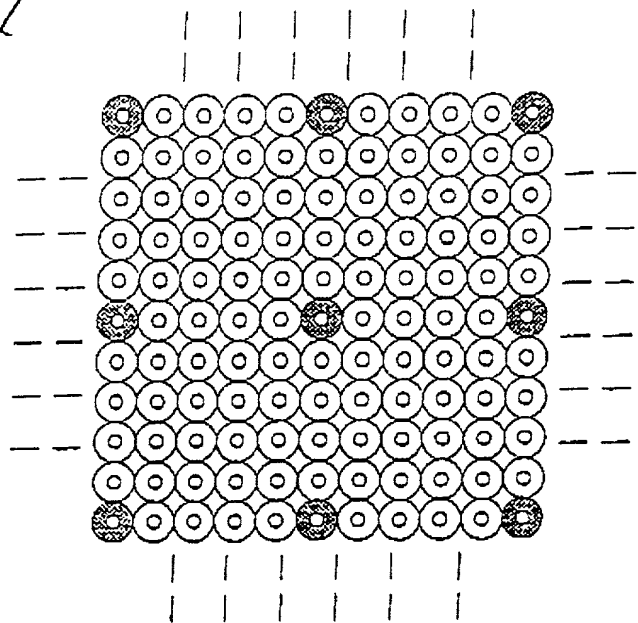


図 9 4

112
~~112~~
~~95~~

FIG 112

25

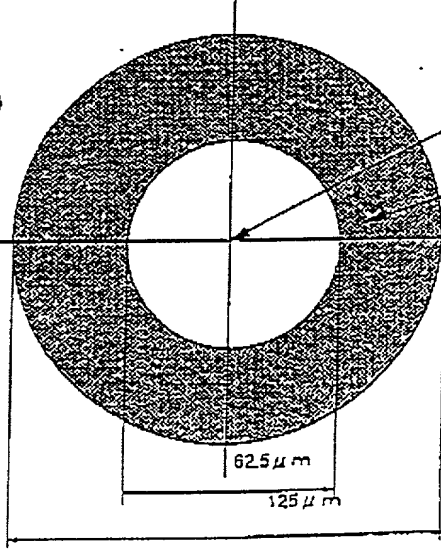
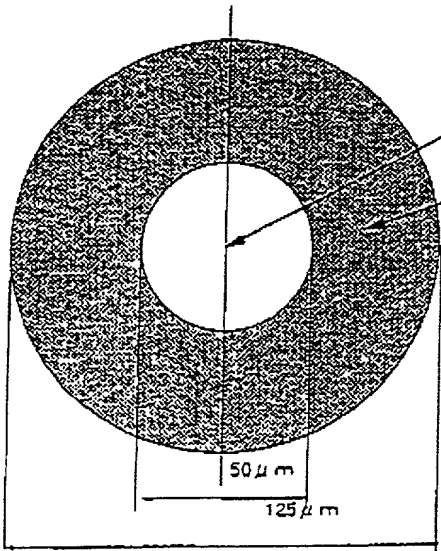


113
~~113~~
~~95~~

(A) FIG 113A

25

(B) FIG 113B



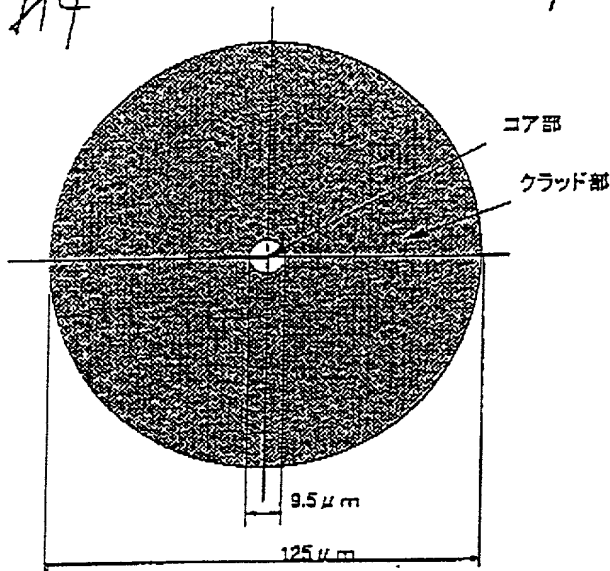
96

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~~FIG 114~~
114

FIG 114

25

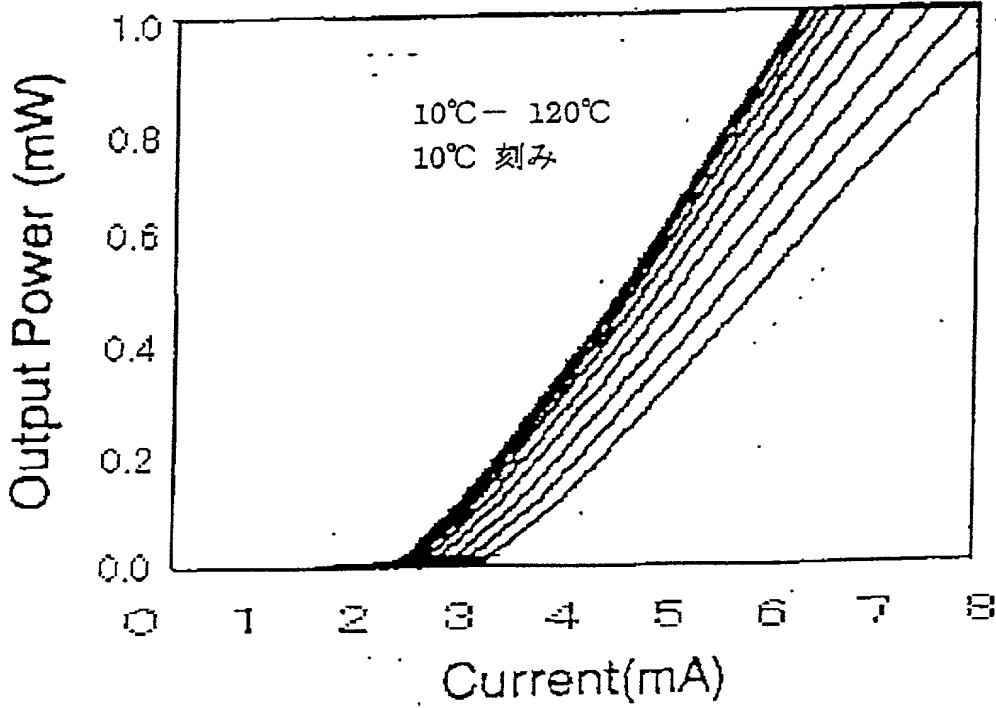


~~FIG 115~~
115

~~FIG 115~~

FIG 115

26

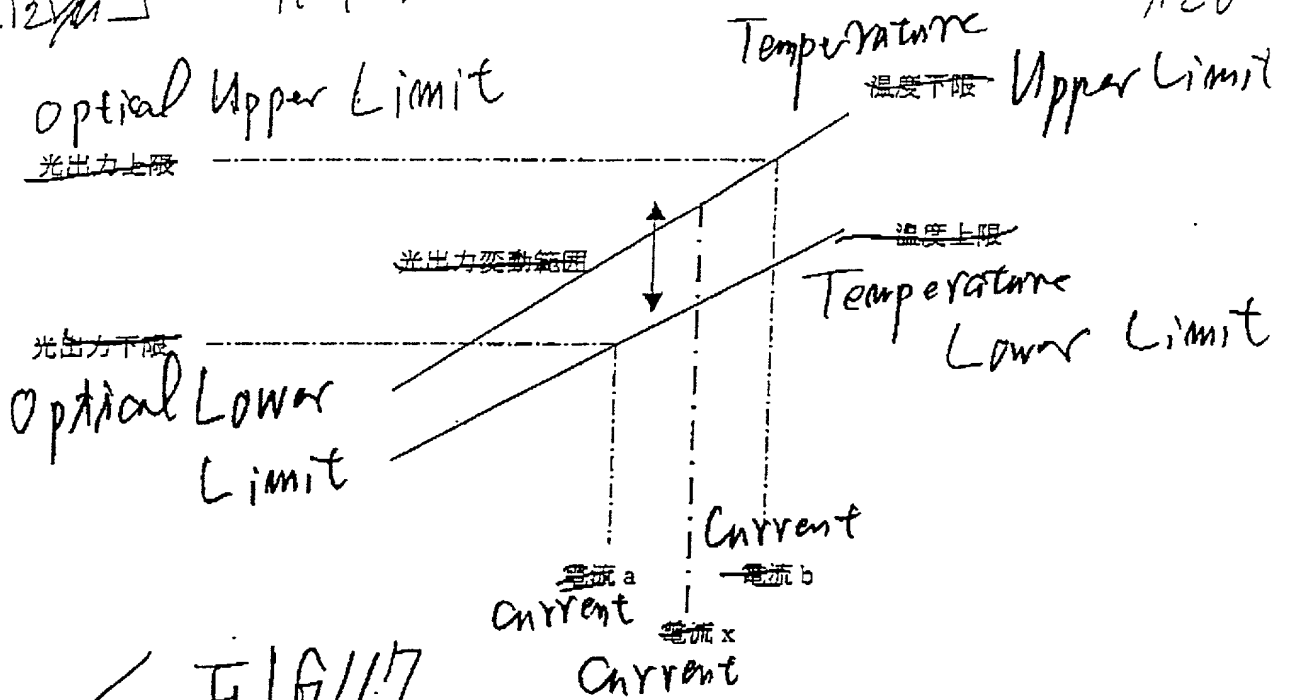


~~FIG 118~~

116
[12/20]

F/G/116

26



117
[12/20]

F/G/117

図 99

27

COMMUNICATION CONTROL

CONVERSION TABLE

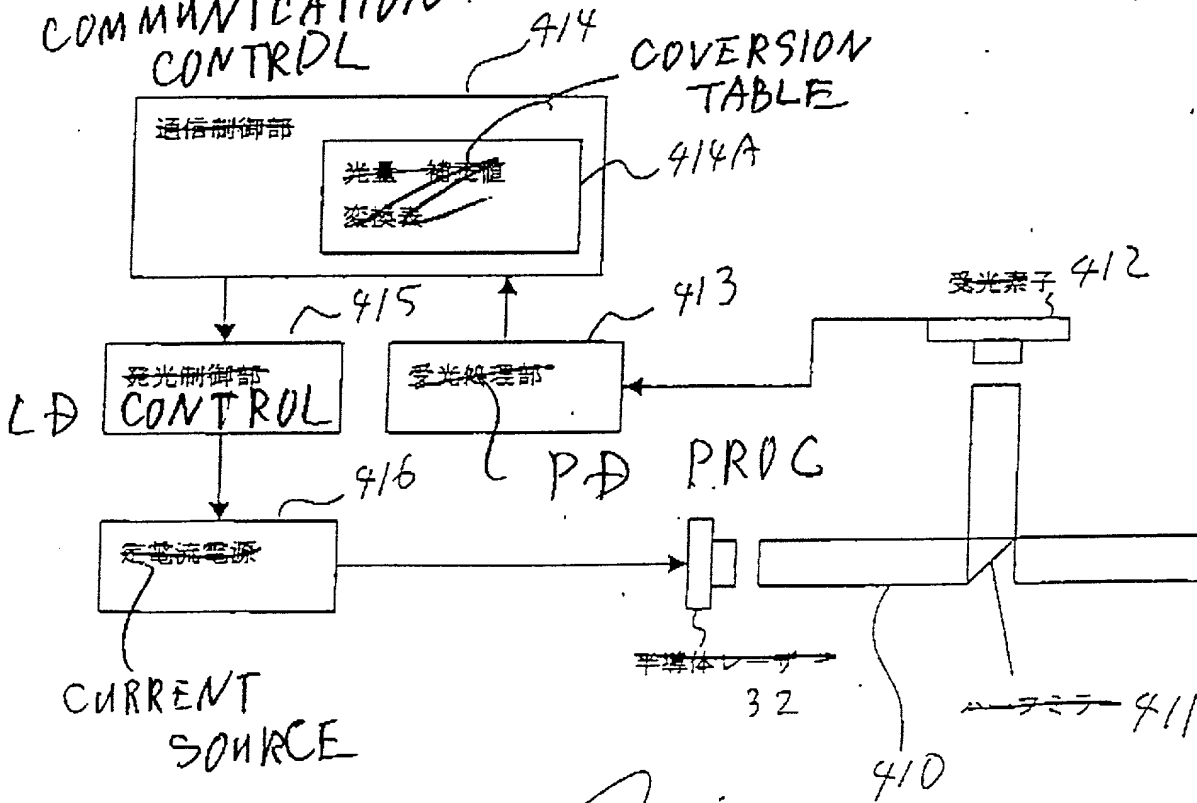


図 100

[2] 119 F/G/118

Fig 28

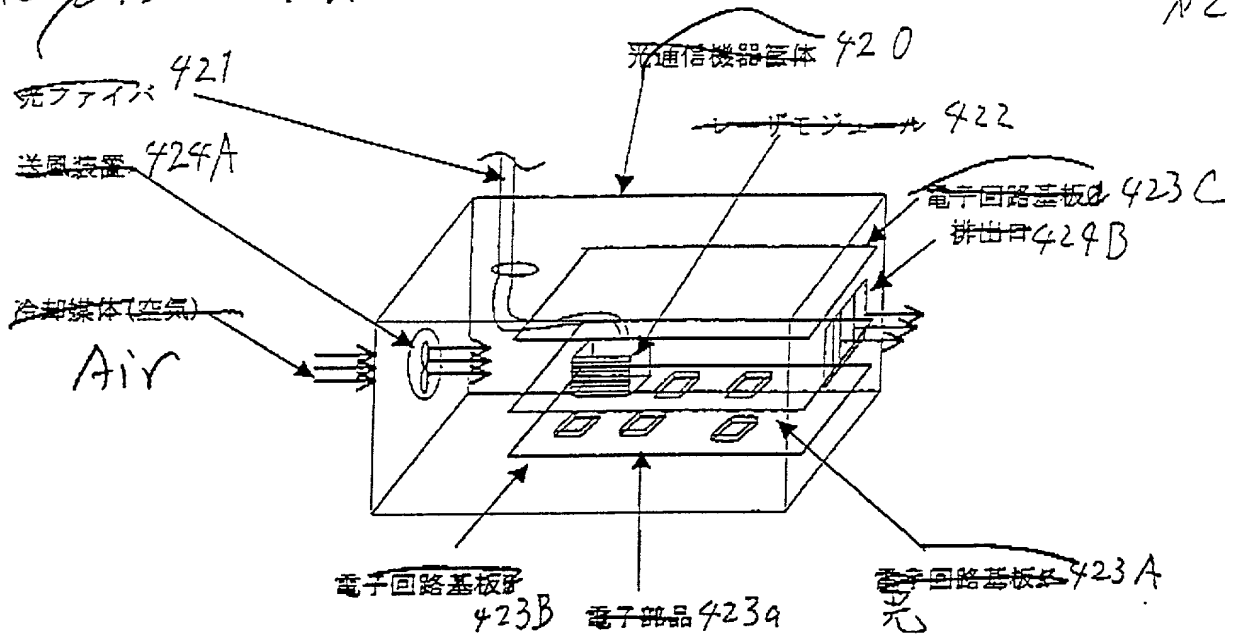


Fig 28

[2] 119 F/G/119

Fig 29

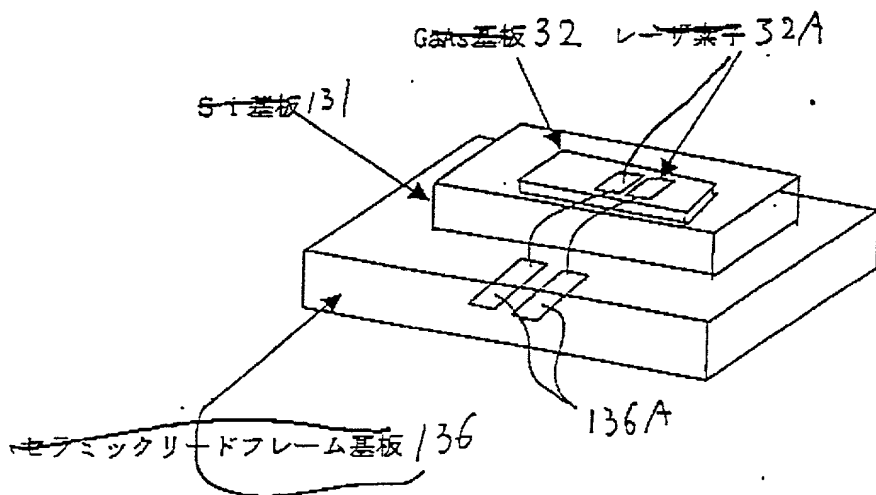
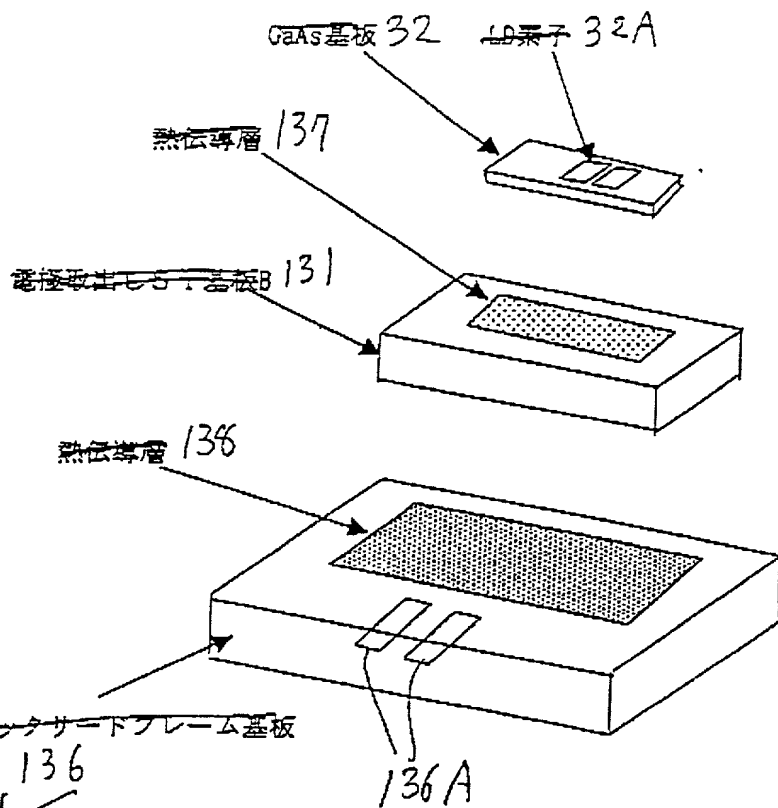


Fig 29

120
~~[12] 43~~ H/G 120

カ29



121
~~[12] 44~~ H/G 121

図120

カ29

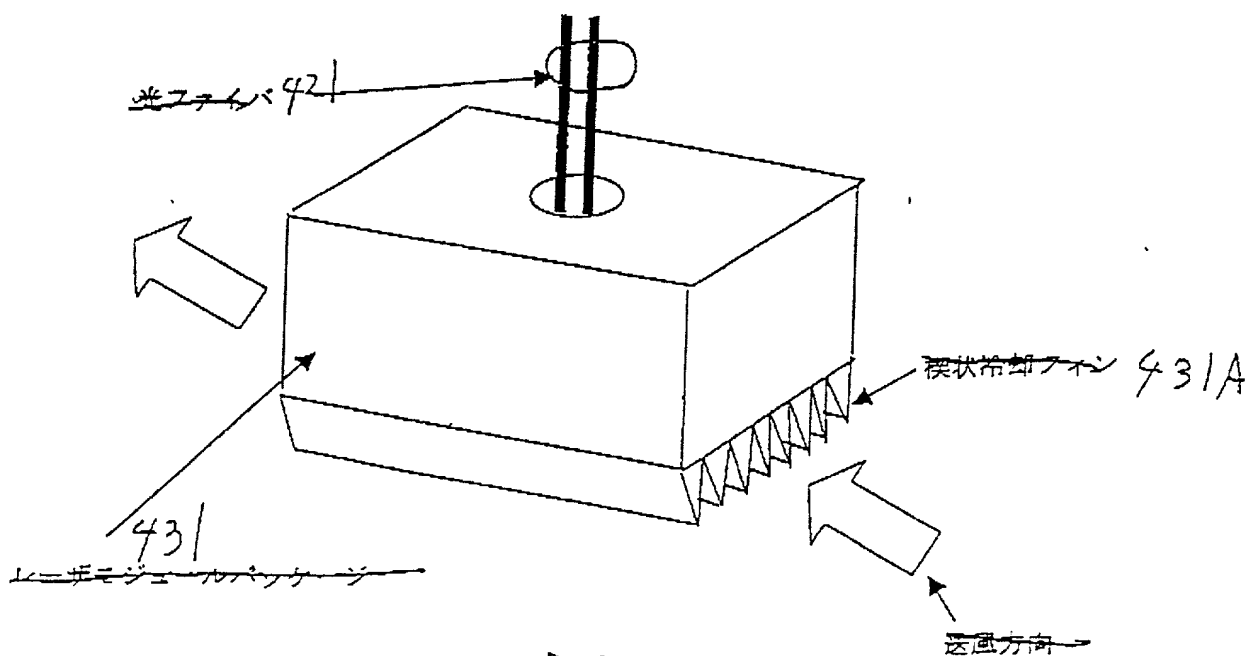


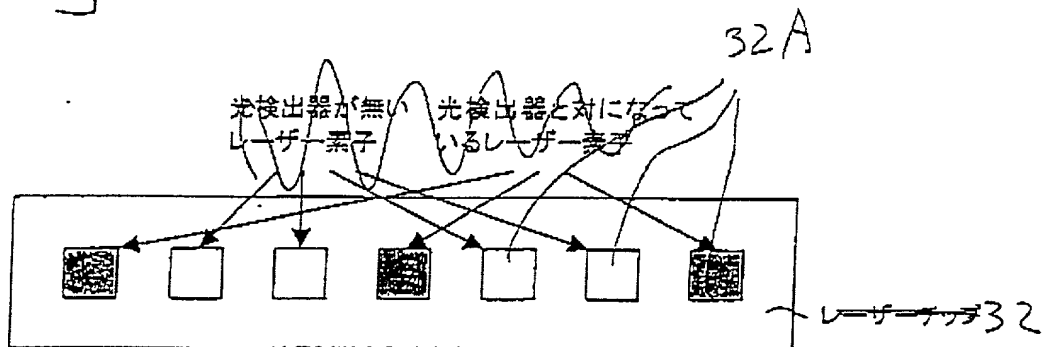
図121

10085204.022602

122
~~[12] 105~~

FIG 122

30



123
~~[12] 106~~

FIG 123

FIG 105

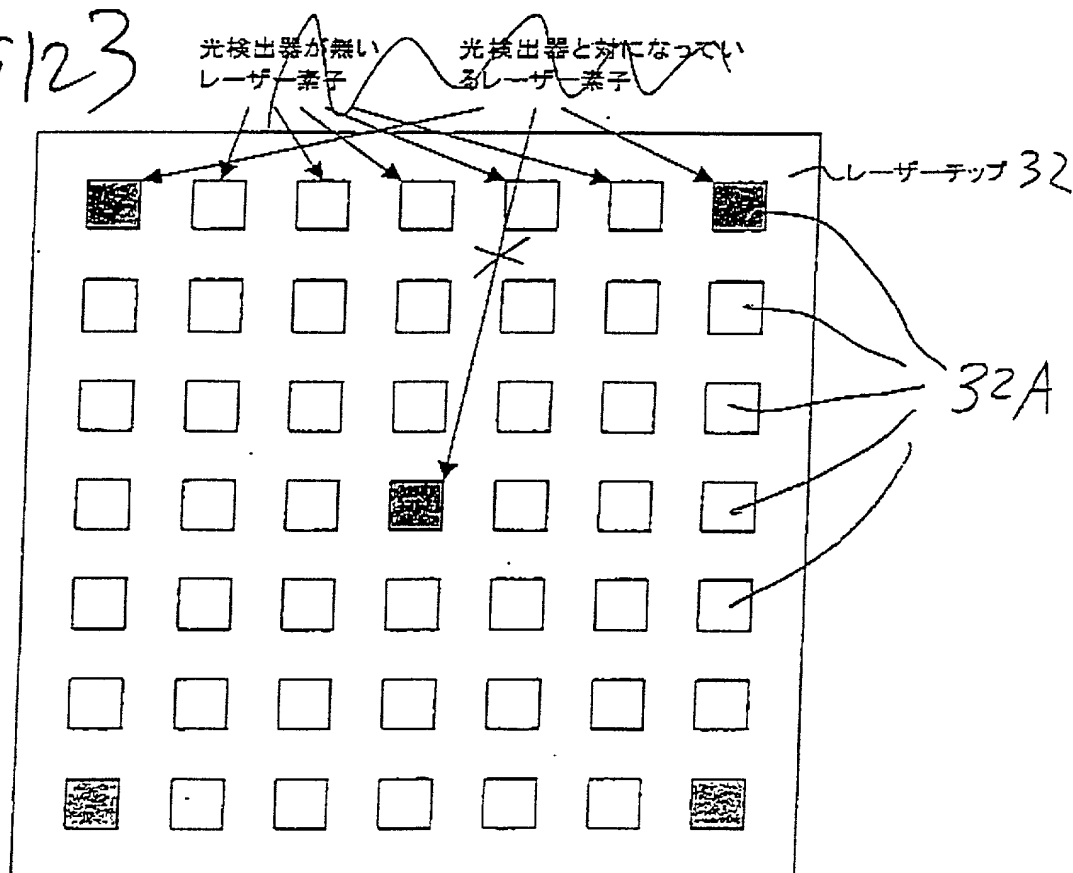
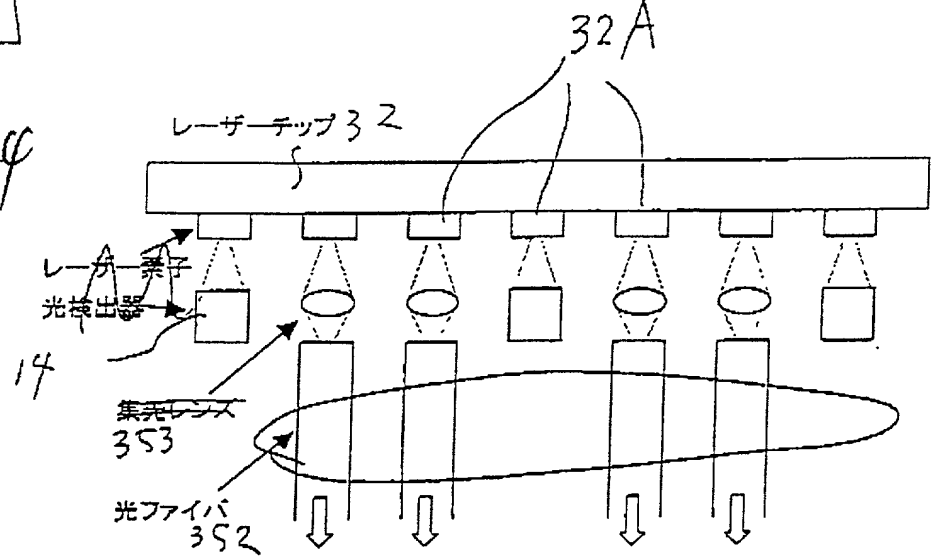


FIG 106

124
~~[124]~~

30

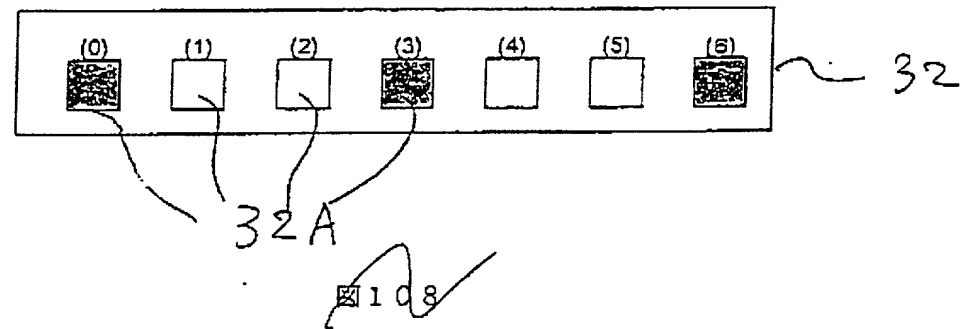
F/G/24



125
~~[125]~~

107

F/G/25



[12/12/97]
 126

930

FIG 126

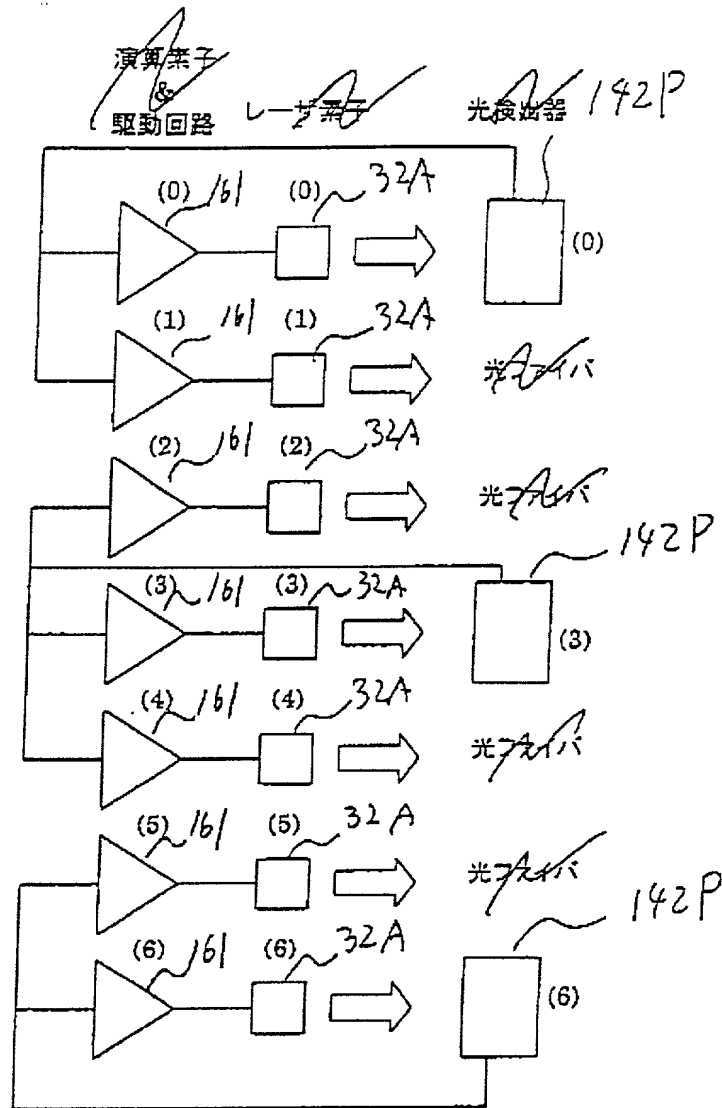


図 109

730

[FIG 127]
127

FIG 127

演算素子
&
駆動回路

レーザー素子

光検出器

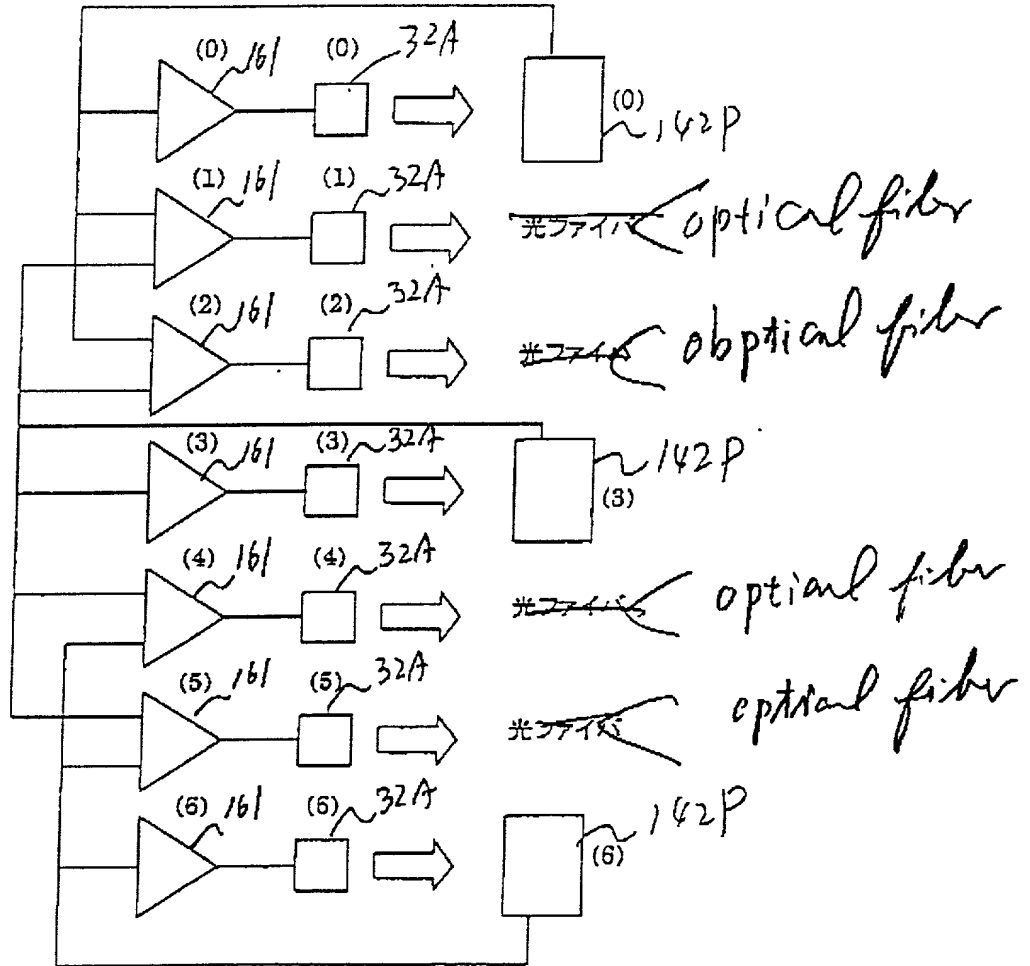


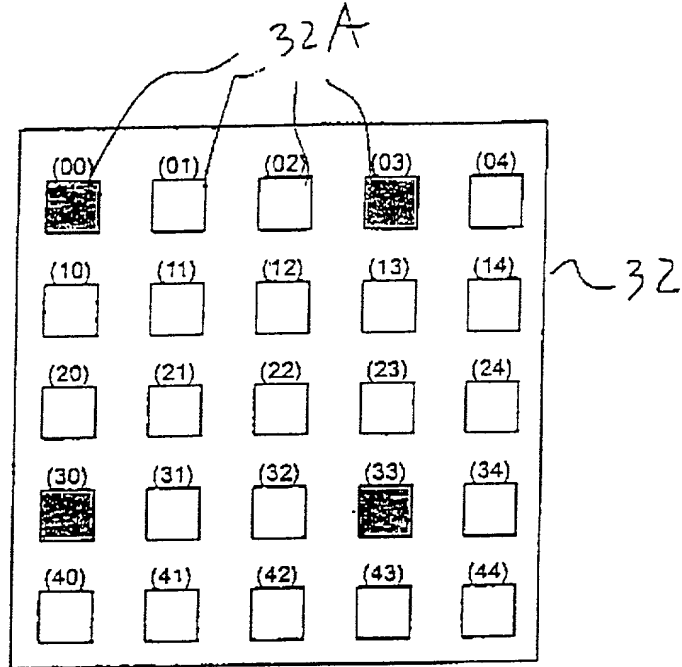
図 127

200220 40258001

[12] 128
128

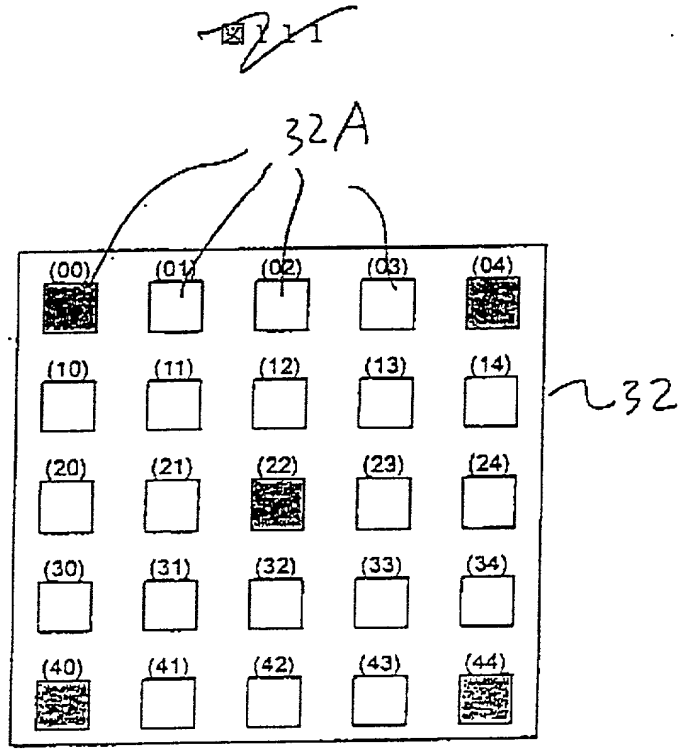
F/G/28

30



[12] 129
129

F/G/29



1 1 2

10085204.0258001

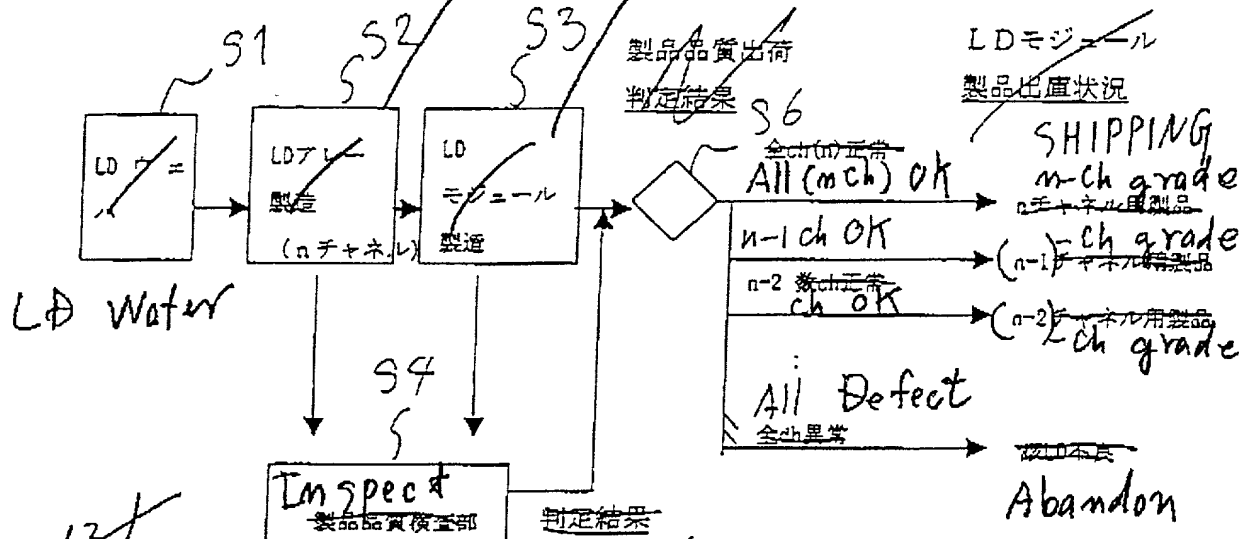
~~FIG 13~~

FIG 130

LD array

Array Module

A31



~~FIG 13~~

FIG 131

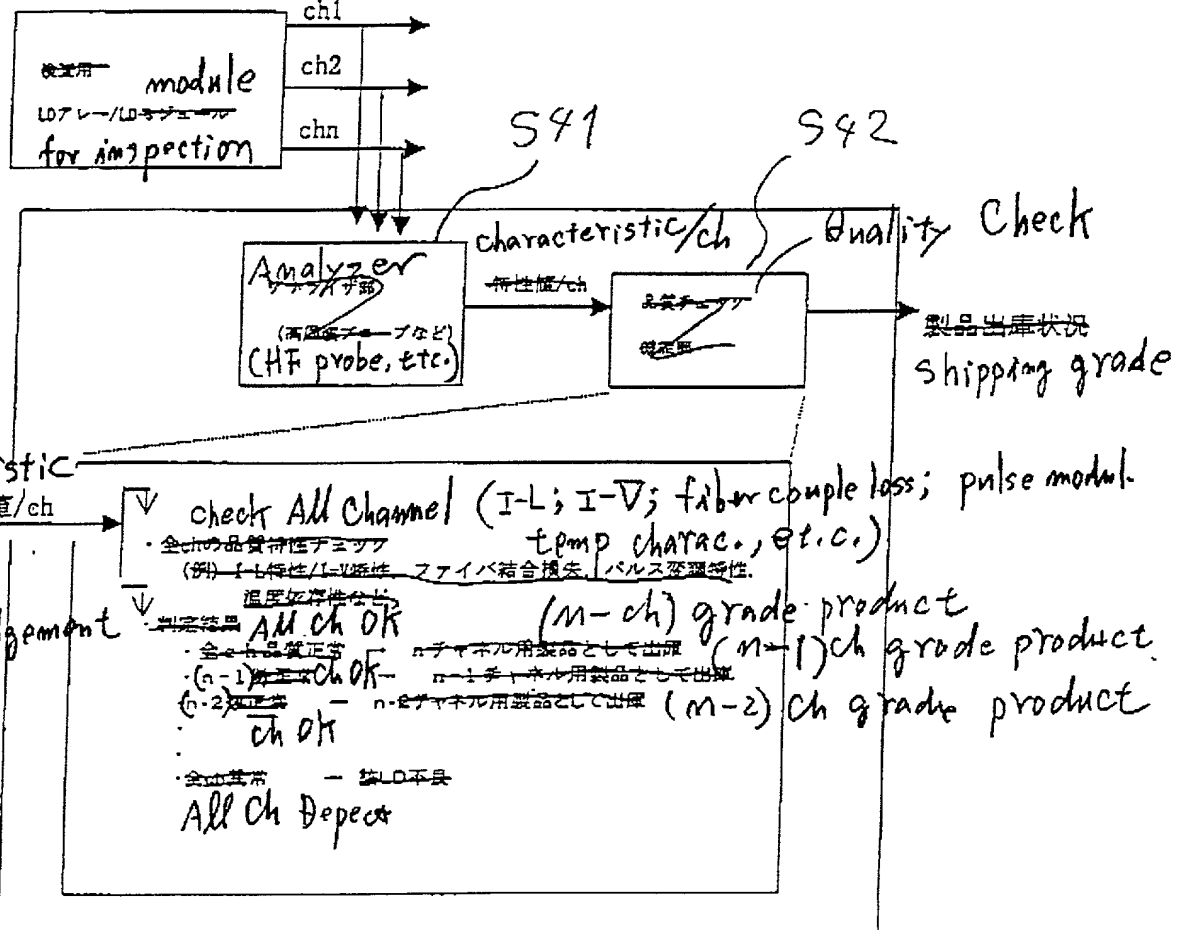


FIG 134

10085204, 022602